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## Fertilizer Plant To Be Constructed In North Dakota

BISMARCK, N.D.—North Dakota Nitrogen, Inc., of this city, announced it had awarded a contract to the Chemical & Industrial Corp., Cincinnati, as consulting and construction engineer for a fertilizer plant in the Bismarck vicinity.

According to Angus M. Taylor, Jr., director of sales for Chemical & Industrial Corp., the plant would utilize lignite coal as one of the raw materials in the production of synthetic nitrogenous fertilizers.

Although Mr. Taylor did not disclose details of the proposed plant, newspaper reports said the plans called for a \$15 million outlay to be built in about two years. The nitrogen plant would, the press reports said, employ about 200 persons in turning out 150,000 to 170,000 tons of fertilizer yearly.

The newspaper report listed Tom Kleppe, president of Gold Seal Co., as president; Thomas Leach, vice president; T. W. Sette, treasurer, and Clifford Jansonius, secretary. All are from Bismarck.

Listed as directors were Herbert H. Hamilton, president of Chemical & Industrial Corp.; Harry Davis, Robert Taft, Jr., and Lawrence Davis, all of Cincinnati.

## U.S. Sulfur Production Reported by Bureau of Mines

WASHINGTON—The domestic sulfur industry produced 355,639 long tons of native sulfur and 50,932 long tons of recovered sulfur during August, reports the Bureau of Mines, U.S. Department of Interior.

The information is based upon reports of producers. Stocks of native sulfur were decreased slightly in July and at the end of August, totaled 4,665,598.

## Progress Pace for Next 25 Years Keynote Of NAC Silver Anniversary Convention

SAVANNAH, GA.—Members of the National Agricultural Chemicals Assn. took a long, proud look at 25 years of growth and progress in the pesticide field during the group's silver anniversary convention here Oct. 29-31—then more than matched the story of the past 25 years with some searching looks into the next 25 years. About 600 attended the convention.

Speakers during the opening session Oct. 29 recalled the bleak conditions in the U.S. in 1933 when NAC was organized. They traced the progress of the organization, which grew up alongside the industry which it serves. They saluted the early pioneers, who made the idea of a pesticide industry association click with,

at times, little more than faith and vision.

But this backward look was a pause, not a stop, and the keynote of this meeting was not the last 25 years, but the next 25.

Jack V. Vernon, Food Machinery & Chemical Corp., New York, NAC president, struck that note when he predicted that industry sales of pesticides will reach at least \$1 billion by 1975 and will climb substantially above that total 25 years from now. Pesticide sales at the manufacturers' level in recent years have been estimated at about \$265 million annually.

One basic reason for this, Mr. Vernon said, is the population explosion

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## Role of Good Public Relations Stressed at Savannah Meeting

SAVANNAH, GA.—A program of getting through to the public's consciousness with facts about the necessary

### NAC COVERAGE

SAVANNAH, GA.—Coverage of the silver anniversary meeting of the National Agricultural Chemicals Assn. which appears in this issue of Croplife is by the following Croplife staff members: Lawrence A. Long, editor, and Donald Neth, managing editor, both of Minneapolis, and Amos Standish, Chicago.

sity for use of various pesticides is of prime importance in maintaining public relations, according to speakers appearing on a panel at the 25th annual meeting of the National Agricultural Chemicals Assn. here Oct. 29. The panel, comprising representatives of the industry, pesticide users, a technical expert and a state agricultural commissioner, appeared at the opening session of the meeting.

Charles S. Maddock, general counsel of Hercules Powder Co., Wilmington, Del., moderator, discussed briefly the interest an attorney has in whether or not his client enjoys good relations with the public. As an example, he said if a company should be involved in a labor dispute in its local plant, the general public's reaction will have a strong influence on the duration and nature of the settlement of the dispute. "If the community's sympathies are with the workers, the dispute probably will be long and costly; but if the company has built a reputation for fairness, for being a contributing member of the community and is recognized as an important or essential part of the community's economy, the undercurrent of public feeling supporting the company will weigh heavily in the balance, and the individual employees involved in the dispute will find it difficult to resist that pressure." Beyond this, Mr. Maddock pointed out, there is far less likelihood of there being any labor trouble if a company has good public relations.

The situation holds true in the agricultural chemical industry. Product liability claims and other areas of litigation provide additional examples of the value of good public relations. "Juries are made up of representatives of the

in this country. Complicating the problems of this increasing number of people is the ever-shrinking acreage of farm land, which at an accelerated rate, is being gobbled up by residential and industrial developments, highways, airports, military establishments, schools and recreational areas.

"For the farmer, his problem is to produce more on less land," Mr. Vernon said. "His increased production must come vertically rather than horizontally. The larger farm, geared to apply technology effectively is much more likely to use pesticides than is the small farm. The larger operations, unlike many small farmers, are unwilling to rely on Providence to protect their crops from the bugs and the blights. They know they can't afford not to use pesticides."

Mr. Vernon warned of the need to improve on some of the "traditional business practices" of the industry.

"All of us should face up more squarely to some of the hard facts about the agricultural chemical industry," he said.

"First, is the fact that we are a low profit business, no matter how we figure profit.

"Second, our inventory problem is a peculiarly complex one.

"Third, our accounts receivable situation adds up to another problem of perplexing magnitude.

"And fourth, our investment in necessary research and development is tremendous, and is becoming greater with each passing year."

Mr. Vernon said that the future will probably see a continuance of attacks on industry on the grounds that pesticides are harmful to human health.

"These attacks are variously motivated, they add up to one of industry's most serious public relations problems," he said. "The best defense is the truth, and the truth is on our side. But we must assume responsibility... for having the truth brought home to the public. We must make known the fact that our industry has been vital in insuring for the people of this nation an ample, safe and nutritious food and fiber supply at moderate cost."

John L. Gillis, Monsanto Chemical Co., St. Louis, told the convention that the changing character of farming practices in recent years has resulted in increased acceptance of chemical insect, weed and disease control as good farming economics.

(Turn to NAC MEETING, page 20)

### Inside You'll Find

What's New	10
Over the Counter	12
Editorials	22
Meeting Memos	23
Advertisers' Index	23
Classified Ads	23

## Accident Rates Drop as Plants Put More Emphasis on Safety

CHICAGO—A panel discussion on accident case histories; the value of safety training in plants; safe handling of ammonia and solutions; and a clinical examination of the accident-prone individual made up an important part of the two-day annual meeting of the Fertilizer Section, National Safety Council in Chicago, Oct. 20-21.

The meetings, held at the LaSalle Hotel, attracted a crowd of nearly 200, representing the fertilizer industry in both the U.S. and Canada.

George L. Dietz, Fertilizer Manufacturing Cooperative, Baltimore, Md., chairman of the section, told the group that among companies co-operating in the safety contest sponsored by the Fertilizer Section, accident frequency rates have taken a significant drop during the past four years.

In 1955, he reported, 173 firms were

in the contest, and their accident frequency rate was 17.27. The next year, 174 firms had lowered the rate to 10.59, and approximately the same score was registered for 1957.

For the first seven months of 1958, however, Mr. Dietz declared that the frequency rate had dropped to 7.94 among the 172 firms participating in the contest. This was heralded by the speaker as being of great significance and encouragement was given to other companies not presently taking part in the program, to do so.

The chairman reviewed the section's activities during the past year, emphasizing the importance of the supervisory training schools held recently in Ithaca, N.Y.; Atlanta, Ga. and Chicago, and yet to be conducted

(Turn to SAFETY MEETING, page 17.)

## Nitrogen Plant Contract Let; San Jose Is Site

SAN JOSE, CAL.—Valley Nitrogen Producers, Inc., has let the contract for plant construction and has hired a plant superintendent.

The Chemical Construction Corp., which has designed and built more than 50 ammonia plants in the last 40 years, has been chosen to build the new plant near here. Work preliminary to actual construction has already begun.

Arthur H. Sulliger, a 20-year employee with the Shell Chemical Corp., is the new plant superintendent. He is a University of California graduate in mechanical engineering and has had many years of experience in all phases of ammonia and ammonium sulphate production.

Plans call for the plant to be completed sometime in late 1959. It will produce anhydrous ammonia, aqua ammonia, liquid mixes and am-

monia sulphate. Distribution will be throughout the state and will include application facilities for those requiring such services, as well as on-the-farm storage programs for those desiring to take advantage of the even greater savings to be realized from bulk storage.

The plant will be patterned after the Mississippi Chemical Corp.'s plant, and construction, start-up and initial operation will be supervised by engineers from the Mississippi Corp.

## A. R. Maas Opens Fertilizer Plant in Northern California

RICHMOND, CAL.—A. R. Maas Chemical Company's first plant in northern California opened here recently to manufacture and distribute phosphoric acid and other fertilizers in northern California and the northwestern states.

The plant, with a potential capa-

city of several hundred tons per day, represents an investment estimated at about \$3 million. It is located on an 81-acre site and consists of six structures used for the following purposes: a phosphoric acid burner, clarifying equipment, elemental phosphorus storage, warehouse for storage of completed chemical formulae, machine shop and a catalyst plant and offices.

The South Gate, Cal., company, which also operates a plant in Silver Bow, Mont., was not distributing fertilizers in northern California before the Richmond plant was completed in September.

Joe Dennis, formerly chief engineer at South Gate, and associated with the firm for 18 years, was named superintendent of the new branch. Georg Sanko, formerly in the Los Angeles sales office, is in charge of sales at Richmond. President of the company is Raymond L. Geiler of South Gate.



Esper K. Chandler

**JOINS NPF STAFF**—Esper K. Chandler, assistant professor of agronomy research at Louisiana State University experiment station, has been named district representative of the National Plant Food Institute for the southeastern regional office. The announcement was made by Dr. Russell Coleman, executive vice president of NPF. Mr. Chandler will be under the supervision of Dr. Samuel L. Tisdale. He was formerly with the Phillips Petroleum Co. as fertilizer sales and agronomic educational representative.

## Hugo Riemer Named To Executive Position

LOS ANGELES—James M. Gerstley, president of United States Borax & Chemical Corp., has announced the appointment of Hugo Riemer to the recently created position of executive vice president of the company. (See Croplife, Oct. 27, page 21) Mr. Riemer was also elected to the board of directors of the company, as was Norman Travis of London.

Mr. Riemer will take up his new duties immediately. He is well known in chemical and fertilizer circles in the U.S., having been with the Allied Chemical Corp. for over 20 years. His last position with that company was as president of its Nitrogen Division.

Currently a director of Borax (Holdings) Ltd., Mr. Travis succeeds D. Abel Smith who has resigned from the board of directors of United States Borax & Chemical Corp. for personal reasons. Before joining Borax (Holdings) Ltd., Mr. Travis was for many years a member of the staff of Imperial Chemical Industries Ltd. and was recently managing director of British Visqueen Ltd., a jointly-owned subsidiary company of Imperial Chemical Industries and Union Carbide and Chemical Corp.

## Norkem Corp. Adds 3 Men; Opens Oregon Branch Office

YAKIMA, WASH.—Norkem Corp., Yakima, announced the addition of three men to its staff and the opening of branch offices at Medford, Ore.

Newly added personnel include Ron James, who will manage the branch in Medford. Mr. James is an Oregon State College graduate and formerly represented Southern Oregon Sales in the sale of agricultural chemicals.

Added to the Yakima staff were Glen Dahmen, a graduate entomologist from the University of Idaho, and Glen Chambers, former owner of Chambers Aviation.

Mr. Dahmen will work with sales representatives on insect problems and Mr. Chambers will be in charge of eastern Washington other than the Yakima Valley area.

Warehouse stocks will be maintained at Medford and the company's full line of agricultural chemicals will be available, said Dr. R. E. Jones, Norkem president and general manager.



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### NITROGEN DIVISION



## Research on Forest Insects, Diseases Advised by USDA Advisory Committee

WASHINGTON—Research on epidemic diseases and insect infestations of forest trees that are potentially capable of lowering or destroying forest productivity was advised by the U.S. Department of Agriculture's forest research advisory committee at this year's annual meeting.

The committee met Oct. 13-18 at Asheville, N.C., and Valdosta, Ga., with field trips to the Cowetta Hydrologic Laboratory near Franklin, N.C.; the school of forestry of the University of Georgia at Athens and Macon, Ga.; the Morgan Nursery, near Macon; the Langdale Co., gum naval stores producers, at Valdosta; and the Olustee Experiment Forest near Lake City, Fla.

In regard to the research on forest tree diseases and insects, the committee observed that thorough knowledge of causes and behavior patterns of insect and disease outbreaks is essential to effective control, and specified the need for studies of sugar maple blight, oak wilt, Hypoxylon canker (of aspens), Douglas fir beetle, and spruce budworm.

The committee also advised that there is a need for research on the types and quantity of forest recreational facilities needed now and in the future. Standards are also needed, according to committee members, for selecting and managing these areas to prevent deterioration of vegetation and soils, and to make recreational uses of forests compatible with other uses, such as timber, water production, forage, and wildlife.

Other research proposals which the committee felt merited high priority follow:

**Timber Management Research:** The top need is for development of forest regeneration techniques—especially for strengthened work in seed production, handling, and physiology in the Pacific Northwest and the South. Next in importance are a need for more basic research in forest tree genetics and more applied tree improvement research in Douglas fir, western white pine, central and southern hardwoods, and naval stores pines.

**Range Management and Wildlife Habitat Research:** New information is needed on how forest lands should be managed in order to support maximum game populations compatible with other forest uses. Also important, in the committee's opinion, is the need to develop efficient livestock grazing practices for insuring continued production of forage on rangelands.

**Watershed Management Research:** Committee members felt that the top priority in this area should go to basic studies of hydrologic and erosion processes. At present, the committee pointed out, this information is not being furnished quickly enough to precede and guide applied studies.

**Forest Protection Research:** Equally needed, the committee noted, are new and improved methods of fire prevention and control, ways of using fire beneficially in forest management, more comprehensive knowledge of biological and silvicultural control of forest insect infestations. The insect investigations should be expanded to include study of all the major forest insect pests in the U.S.

**Forest Economics and Marketing Research:** Top priorities were assigned to strengthening the Forest Survey, to provide more complete and up-to-date information on the nation's forest resources, and to improving programs designed to aid small forest owners.

Forest Products Utilization Re-

search: The committee advised expanded research on the conversion of wood to chemical products. Also important are improved log and tree grades and development of equipment and methods for harvesting wood residues and small timbers, products now underdeveloped because of high harvesting and transportation costs.

Established under the Research and Marketing Act of 1946, the committee is made up of authorities on forest problems. Its detailed recommendations for forestry research will be submitted formally to USDA within the next few weeks. Copies of this report will be available from the committee's executive secretary, Dr.

Carleton P. Barnes, Office of the Administrator, Agricultural Research Service, U.S. Department of Agriculture, Washington 25, D.C.

Gus P. Backman, committee chairman and secretary of the Salt Lake City (Utah) Chamber of Commerce, presided.

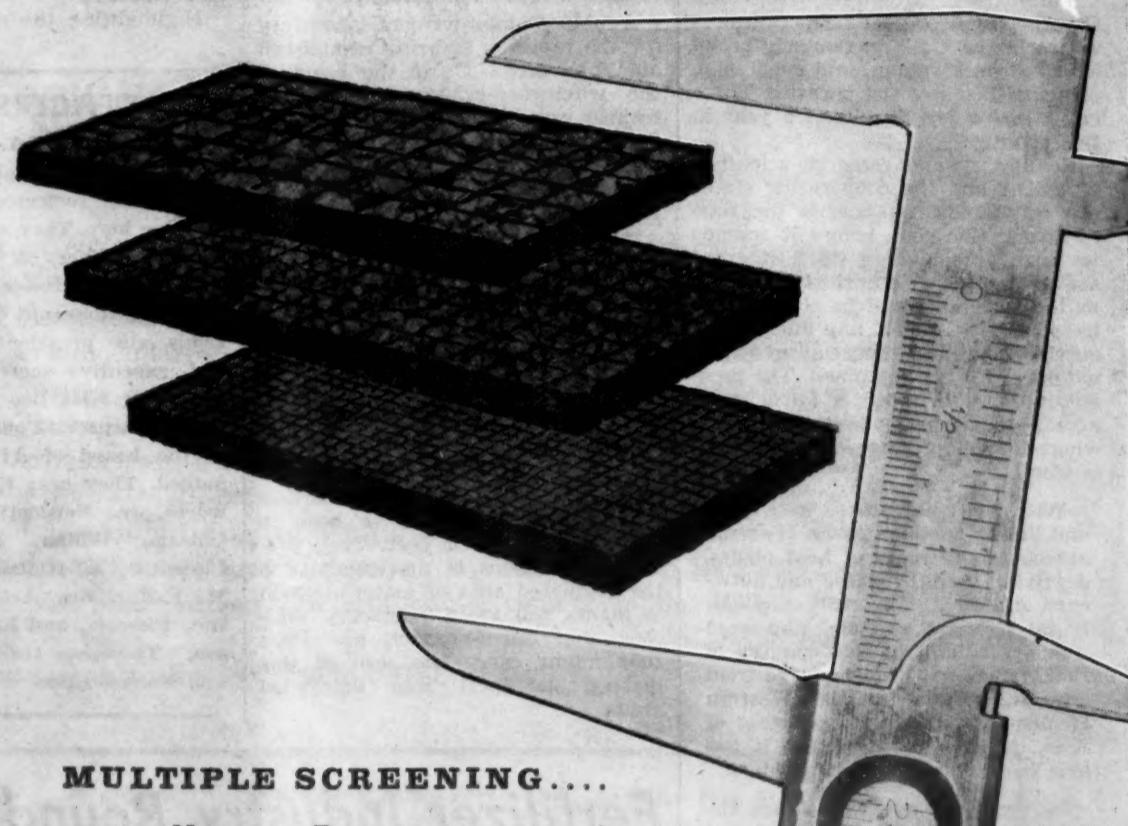
Other members who attended were: John A. Beale, chief state forester, Wisconsin conservation department, Madison, Wis.; T. E. Bercaw, chief of the forest management section, Gaylord Container Corp., Division of Crown-Zellerbach Corp., Bogalusa, La.; C. D. Dosker, president, Gamble Brothers, Inc., hardwood fabricators, Louisville, Ky.; Dean George A. Garratt, Yale University school of forestry, New Haven, Conn.; Seth Gordon, director of the California department of fish and game, Sacramento, Cal.; C. C. Heritage, consulting engineer, Tacoma, Wash.; Harley Langdale, Jr., president, the Langdale Co., pine products manufacturers,

Valdosta, Ga.; P. Dewey Lyman, farmer and maple producer, White River Junction, Vt.; Lloyd E. Partain, manager, trade and industry relations, the Curtis Publishing Co., Philadelphia, Pa., and Otto J. Wolff, sheep raiser, Rapid City, S.D.

### Form Weed Control Group

**TUOLUMNE, CAL.**—The Tuolumne County Farm Bureau has formed a Weed Control Committee to organize a program of eradication of two serious weed pests which have been found in the county. These are Medusa-head and barbed goatgrass, both annual weedy grasses. Both of the grasses have undesirable characteristics and if allowed to spread pose a definite threat to the maintenance of good range species. Livestock will not graze either Medusa-head or goatgrass at any stage of plant growth with the possible exception of a short period in the spring.

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## Farmers, States in Witchweed Battle Through Carolinas

### Intensive Program Under Way as Congress Earmarks \$3 Million for Project

WASHINGTON—An intensive effort to eradicate witchweed, a parasitic plant that attacks corn and some other crops, is getting under way in North Carolina and South Carolina, the U.S. Department of Agriculture announced.

Congress has appropriated \$3 million to initiate the program, a co-operative undertaking by USDA, agricultural agencies of the two states, and farmers in the infested area.

This destructive foreign weed has invaded six counties of northeastern South Carolina and 12 adjoining counties in southeastern North Carolina. Farmers in the area are being asked to use or permit witchweed-killing practices on their land, beginning next spring. The cooperative eradication campaign will extend over some 75,000 acres of cultivated land and 20,000 acres of uncultivated land on 3,404 farms in the 18 counties.

Eliminating witchweed from the Carolinas will protect farmers everywhere in the U.S., particularly growers of corn, sorghum, and sugarcane, principal hosts of the parasite. These crops are worth \$5 billion a year in this country.

Regulatory and research scientists of USDA and the cooperating states are convinced that now is the time to attack this pest, before it spreads to farm areas where its host crops are grown more intensively. Surveys in the Carolinas and in other states have failed to reveal any infestations outside the 18-county area where witchweed is now confined. The present infestation covers a fairly small acreage in a closely knit trade area, where danger of long-distance spread is small.

Witchweed parasitizes host crops and finally destroys them. Its roots attach to the roots of host plants, depriving them of water and nutrients. Affected plants wilt, gradually turn yellow, and die. The weed was first found in this country in 1956. It has not been reported from any other part of the Western Hemisphere, but in large areas of Asia, Africa, and Australia it has long been a serious pest problem.

The weed is known to attack rice, wheat, oats, and barley—as well as corn, sorghum, and sugarcane. It also parasitizes crab grass and 60-odd other grasses. Crab grass is abundant in the southeastern United States along roadsides and fence rows, in wasteland, and in cotton, tobacco, soybean, and peanut fields.

To disrupt normal farm practices as little as possible, both chemical and cultural methods of eradication will be used.

Witchweed has not yet gained a stranglehold on the greater part of the infested acreage, and corn crops are still possible on some of the land there. Owners of such land will be asked to plant corn as usual. When witchweed comes up, pest-control workers of USDA's Agricultural Research Service will spray the fields with the herbicide 2,4-D.

The dosage of this chemical to be used will not injure corn but will kill the weed before it can bear seed. The herbicide's destruction of other weeds as well should help to increase corn yields. roadside rights-of-way and other un-

tilled land will get similar treatment.

On more heavily infested land, however, corn-growing is no longer profitable because of witchweed. On this land the plan is for farmers to "cultivate witchweed to death." They will contract to furnish labor, implements, seed, and fertilizer, for which they will receive payment from the cooperating control agencies.

Under this scheme a farmer will plant corn but will plow it under when witchweed appears and before the weed can make seed. Then he will repeat the process with a second "catch" crop—sorghum or millet. Late in the fall, he will put in a winter cover crop, a small grain that will promote germination of more witchweed seed. Witchweed plants that develop will normally be killed by frost before their seed matures.

**Stimulating witchweed plants to grow speeds eradication, for unless they receive a "go" signal from a plant on which they can germinate, witchweed seeds may lie dormant in the ground for years. Infested areas will require survey for several years before eradication is certain.**

Earlier this year, field tests of cultural and chemical eradication methods got under way on about 1,000 acres of cultivated land and 4,000 acres of untilled land in the infested areas. Locations having different soil types and cropping practices were chosen for these pilot eradication tests, which are continuing.

A methods-improvement laboratory for the program is being established at Whiteville, N.C., in the heart of the witchweed-infested area. Here trained scientists will seek more effective and less expensive ways of eradicating witchweed, as well as answers to new eradication problems as they arise.

**Land for this laboratory has been made available by the North Carolina State Department of Agriculture. The laboratory will be operated cooperatively by the Agricultural Research Service and the North Carolina and South Carolina agricultural experiment stations.**

Federal and state plant quarantines aimed at preventing further spread of witchweed have been in effect more than a year. They prescribe conditions of movement from the regulated area of materials such as plants, soil, tools, machinery, vehicles, and farm-product containers that might carry the seed of this underground pest into uninvaded areas.

## Fertilizer Industry Round Table Discussion Topics Announced

WASHINGTON—"Economics of Preventive Maintenance" is the title of the opening session of the Fertilizer Industry Round Table which will be held at the Mayflower Hotel here, Nov. 5.

The meeting, which lasts through Nov. 7, will feature such discussion topics as: "Economics of Processing," set for Nov. 6; and "Economics of Formulation," set for Nov. 7. Two other topics will be covered.

According to Dr. Vincent Sauchelli, chemical technologist for the Nation Plant Food Institute and chairman of the Round Table, some of the questions to be covered during the first day of the meeting include:

- What is the formula for balance between maintenance, labor, cost and equipment replacement?
- Will a dust-collecting system pay in preventive maintenance and operation costs?
- What are the economic advan-

## Variety to Get Top Billing At California Fertilizer Meeting

LOS ANGELES—Film stars, golf tournaments, dancing and banquets, plus a full run of business meetings, panel discussions and addresses, will be the order of the day for the 35th annual convention of the California Fertilizer Assn. here Nov. 9-11.

Heading up the list of business events will be a panel discussion on "Building For the Future." Dr. D. G. Aldrich, chairman, department of soils and plant nutrition, University of California at Davis and Berkeley, will be the moderator.

Panel members include Roy Kennedy, general credit manager, California Spray-Chemical Corp., Richmond, Cal.; J. Earl Coke, vice president, Bank of America, San Francisco; R. L. Luckhardt, supervisor, agricultural technical service, Collier Carbon and Chemical Corp., Brea, Cal.; W. L. Dixon, Jr., vice president and general manager, Pacific Guano Co., and president and general manager, Western States Chemical Corp., Berkeley; Dement W. Galbraith, president, Agriform of Northern California, Inc., Woodland, Cal.; Ralph S. Waltz, vice president and manager-agricultural department, Wilson & Geo. Meyer & Co., San Francisco, and James F. Sloan, president, J. F. Sloan Co., Salinas, Cal.

Film personality Ronald Reagan will address the group on Nov. 10. His subject will be "Show Business and Business."

Highlighting the non-business por-

tion of the convention will be entertainment by musical star Carol Channing on Tuesday evening, Nov. 11.

The annual banquet will be held Nov. 11, in the Cocoanut Grove where dining and dancing music will be provided by Freddie Martin and his orchestra.

A golf tournament will be staged for both the ladies and the gentlemen. The ladies golf date is set for Nov. 10, at the Wilshire Golf and Country Club. The men will tee off on Nov. 11, at the Inglewood Golf and Country Club.

A full program of events is scheduled for the ladies.

## NAC's Regulatory Advisory Committee Reports Activities

SAVANNAH, GA.—Meeting in conjunction with the silver anniversary celebration of the National Agricultural Chemicals Assn., the organization's Regulatory Advisory Committee reported on its activities of the past year.

This committee was formed in May, 1957, from representatives of the association's members, who include over 90% of the basic manufacturers of agricultural chemicals in the U.S. The committee's function is one of liaison between industry, the U.S. Department of Agriculture, and the Food & Drug Administration of the U.S. Department of Health, Education and Welfare. It was organized to aid in solving mutual problems resulting from the administration of the Miller pesticide residue amendment to the Federal Food, Drug and Cosmetic Act and the Federal Insecticide, Fungicide and Rodenticide Act, as related thereto.

In opening the committee meeting, NAC president, J. V. Vernon, praised the U.S. Department of Agriculture and the Food and Drug Administration for their very cooperative attitude and said: "Without the sincere cooperation that has been given to our committee members by the federal authorities, the pesticide industry would have been faced with many grave problems in striving to abide by the letter of the law."

Mr. Vernon thanked all of the committee members for their splendid work and stated that the entire industry owed them a debt of gratitude for their thorough and detailed studies and presentations which have eased the work of both the federal authorities and the industry.

"The importance of this liaison work between the federal authorities and the industry is clearly indicated by the unparalleled degree of safety in the use of pesticides that is now possible through the correct application of the principles for which the Federal Insecticide Act and the Miller amendment were designed," concluded Mr. Vernon.

## Merck Representative, Arthur F. Frantz, Dies

RAHWAY, N.J.—Arthur F. Frantz, 56, agricultural sales department representative for Merck & Co., Inc., Chemical Division, died Oct. 18 in San Francisco. Mr. Frantz, who joined the Merck Quarter Century Club in September, 1958, was well known in agricultural circles throughout the San Mateo and San Francisco areas. For several years prior to his assignment in California, Mr. Frantz represented Merck in the Midwest with headquarters in Chicago.

Mr. Frantz was born in Lehighton, Pa., and received his degree in chemical engineering from Cornell University. His wife, Vivian, and a son, Donald, survive.



Dr. Robert L. Metcalf

**SOCIETY MEETING** — The Entomological Society of America will hold its annual meeting Dec. 1-4 at the Hotel Utah in Salt Lake City. Attendance of 800 from a national membership of over 4,000 is forecast. Entomologists from Alaska, Hawaii, Canada, England, Mexico, Central America, and many other nations will participate. Dr. Robert L. Metcalf, chairman, department of entomology at the University of California Citrus Experiment Station, Riverside, is president of the society. Over 300 papers, covering all aspects of entomology, numerous symposia, and outstanding invitational speakers make up the four-day program. Mr. Metcalf, in a recent message to the society, brought into sharp focus the fact that entomology concerns itself with two-thirds of all living organisms, including many of man's most vigorous competitors.

#### New Virus Disease Cherry Tree Threat

**BERKELEY, CAL.** — California's commercial cherry growers face the threat of a new virus disease that may inflict wide crop damage unless "extreme caution" is used.

George Nyland, plant pathologist at the University of California, Davis, warns that certain flowering cherries in the state are infected with a serious disease similar to the "little cherry" virus disease of sweet cherries.

If transmitted to commercial orchards, the new virus could produce small fruit that fails to ripen and becomes unmarketable.

Growers must use extreme caution, Mr. Nyland said, to prevent the establishment of the virus in commercial orchards. No sweet cherries should be propagated on rootstocks that have previously received buds of flowering cherry. Such propagation would be a sure way to infect sweet cherries, he said.

The ornamental cherries carrying the virus are Kwanzan and Shirofugen. Mr. Nyland said there was no evidence that the virus spreads naturally from flowering cherry to sweet cherry in California, but this has occurred in Oregon and Washington.

Unless an insect carrier spreads the disease naturally, Mr. Nyland said, growers should be able to prevent contamination of sweet cherry stocks by using only buds from registered stock and by not rebudding mazzard stock with sweet cherry if flowering cherry buds fail.

The new virus causes a disease much like California's "buckskin" disease, Mr. Nyland said, but potentially much more serious.

#### S.C. FERTILIZER SALES

**CLEMSON, S.C.** — B. D. Cloaninger, director of the Clemson Agricultural College here, reported that 29,006 tons of fertilizer were sold in September of this year or 5,184 tons more than a year ago.

#### S.D. Scientists Start Cyst Nematode Check

**BROOKINGS, S.D.** — Plant pathologists are about to begin a survey in eastern South Dakota to see if the soybean cyst nematode has invaded this area.

C. M. Nagel, head of the plant pathology department at South Dakota State College, says the disease is caused by a microscopic organism that lives in the soil and attacks the roots of the soybean plant. It has spread rapidly since its discovery in a North Carolina county in 1954 and is known to be in southern Missouri now.

The survey will begin as soon as farmers complete their soybean harvest. Scientists from South Dakota State College and the U.S. Department of Agriculture will collect soil samples from soybean fields and examine them for the organism.

Mr. Nagel says the disease causes

severe stunting and premature yellowing of the plants. Soybeans that are severely infected seldom produce seed. Should the disease be found in South Dakota, Mr. Nagel states that a program for its control will be put into effect.

#### Smog Called Leaf Drop Cause by Californian

**BERKELEY, CAL.** — New evidence that smog is a factor which can cause excessive leaf drop of citrus has been found by a University of California scientist.

O. C. Taylor, assistant horticulturist at the citrus experiment station, Riverside, reported 12 times as much leaf drop in smog-exposed grapefruit trees as in protected trees of the same type and age.

Rooted lemon cuttings, in the same type of test, lost over five times as many leaves when exposed to normal Los Angeles County air as did the

**CROPLIFE**, Nov. 3, 1958—5  
check group in filtered air. The experiments were conducted at the Los Angeles State and County Arboretum, near Arcadia.

Near Rialto (San Bernardino County), West Indian lime seedlings dropped 12 times more leaves during three months' exposure to normal air than comparable seedlings growing in filtered air, Mr. Taylor added.

He also found a 29% reduction in growth of the seedlings.

"There seems to be little doubt that the oxidant type pollutants greatly encourage leaf drop of citrus and have a significant suppressing effect on growth," Mr. Taylor declared.

#### NEW NURSERY

**SAN CARLOS, CAL.** — Scram's Nursery, located at 1312 Laurel St., here, opened recently. Owned by Roy Scramaglia, the nursery handles fertilizers, seeds and agricultural chemicals for the lawn and garden.

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**LOW STAVE ON THE BARREL . . .**

# How Much Is Fertilizer-Crop Yield Relationship Affected By Lack of Single Nutrient?

By Dr. Vincent Sauchelli  
Chemical Technologist  
National Plant Food Institute  
Washington, D.C.

EVERYONE is familiar no doubt with that picture of a barrel having staves of different lengths and the admonition that this barrel will hold no more than the level of the lowest stave. Such a convincing picture appeals to one's common sense as being unquestionably true. By analogy that truism has been applied to the explanation of plant nutrient deficiency to support Liebig's "law of the minimum"—a crop can be no higher than the level of the lowest plant nutrient.

We have often been cautioned that carrying an analogy too far has its pitfalls. It is the belief of many soils men and biologists that this "low stave" analogy has been misused in efforts to explain soil nutrient deficiencies. Emil Lang in 1924, discussing the law of the minimum (1) said: "Should the progress of our knowledge actually lead to the minimum law sometimes becoming superfluous, it will be especially difficult to force it out of the attics of our agricultural schools, where in the course of time it has become a cabinet specimen in the museum of rural culture."

The force of a good picture to impress on the mind of the reader a certain concept—right or wrong—was never better exemplified than in this low barrel stave illustration.

Liebig's law of the minimum states that the nutrient present in the least relative quantity determines what the crop yield shall be. If, for example, a soil contains enough nitrogen for a crop of 50 bu. an acre, enough phosphorus for 60 bu. and enough potassium and other nutrients for 70 bu., the crop that can be produced will be 50 bu. only, because that is the size of yield that is governed by the limiting factor, nitrogen in this case. Little is gained by having the other nutrients present in relatively larger amounts than the nitrogen, until the nitrogen level has been raised as high as the next-lowest limiting nutrient, and so on.

In other words, the yield is directly proportional to the amount of deficient nutrient present in the soil.

It has long been understood that a mixed fertilizer must supply nitrogen, phosphorus, potassium, sulfur, magnesium, calcium and trace elements in forms that can be assimilated by the roots of plants. Each of these nutrients is essential to plant life. Early in this century agronomists and soil scientists began to investigate exactly how plant nutrients acted, quantitatively, to sustain and promote plant growth. Liebig had shown back in 1840 that plants feed on inorganic minerals present in the root zone and many scientists had since then enlarged the field of plant nutrition. It was not until E. A. Mitscherlich in Germany published his investigations around 1909, however, that a fruitful technique was evolved for definitely determining,



Dr. Sauchelli

quantitatively, the action of nutrients involved in plant growth.

Mitscherlich reasoned that all plants feed on the same group of nutrients, N, P, K, Mg, Ca, S, and so on, and that each is essential as any other; meaning that, if even one is missing, the plant fails to develop. Agronomists had from experience and observation concluded that the absolute quantities of these different nutrients are of importance. If there is a deficiency in soil nitrogen, for example, the crop will be short regardless of how abundant the others may be. If, now, the nitrogen content of this poor soil is somewhat increased, the yield will be increased to a certain degree; if the amount of nitrogen added is further increased, the yield will be further increased, assuming always the other nutrients are still present in abundance and, of course, including moisture. However, this process cannot be carried out indefinitely. There is a limit to the growth of any plant even in the most fertile soil. Hence, beyond a certain level of nitrogen in the soil, it is found that any addition beyond this point will not bring forth any additional yield. This fact has been described as "the law of diminishing returns in agriculture" and expresses a truth confirmed by many thousands of field experiments with all kinds of plants, in all parts of the world. No one anywhere has been able to obtain an unlimited amount of vegetable substance from a limited area of soil in one cycle of plant growth, that is, from seed to seed. Plants absolutely will not amplify their growth beyond a certain point regardless of how scientifically the soil is fertilized, or how carefully its moisture, light and warmth requirements are satisfied.

Liebig was a great scientist to whom the whole world owes infinite gratitude for his contributions to agriculture's ability to furnish an abundance of food and fiber. He knew about the law of diminishing increments of yield. Yet, Liebig believed that if proper management of the soil could be learned there would be no limit to the amount of vegetable substance that could be grown even from a small area of ground—even "from a flower pot."

In other words, he and many of his followers believed that the graph of the yield of any species of plant is a straight line that would ascend indefinitely. It is now generally accepted by scientists, thanks to Mitscherlich and others of his school, that the graph of the yield is a curve that cannot be straightened out. It will ascend to a certain height and then inexorably tends to flatten out.

## A Dominant Minimum?

It is not strictly true that the minimum factor, the one present in the smallest number of units, holds complete dominance over any given situation in plant culture. An addition of any factor of plant growth is capable of increasing yield to a certain degree so long as it is not present already in its maximum amount, regardless of what is done or left undone about the other factors. Mitscherlich showed by many experiments that "the magnitude of the yield is conditioned by all the factors of growth. Each single factor exercises the greater limiting influence

on yield the nearer it is to the minimum."

This statement implies that the addition of a slightly deficient factor will increase yields because it will help the minimum factors to be used more efficiently. He found that no matter what kind of crop he studied, or what growth factor he was investigating, the normal increase of yield conformed accurately to a single type of curve that could be represented by the equation:

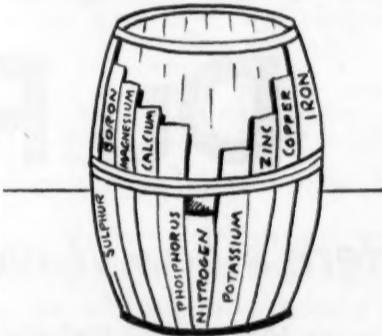
$$\frac{dy}{dx} = (A-y) \cdot C$$

in which A is the limit of yield attainable by a particular crop plant, X is the specific plant nutrient and y is an intermediate yield produced by a specified number of pounds of x, and C is a constant effect factor characteristic for each particular kind of plant nutrient and it determines the slope of the curve.

About nine years after Mitscherlich published his first results a mathematician at the University of Gottingen by the name of B. Baule rewrote the equation in this form:

$$\log 100-y = \log 100-0.301x$$

Baule substituted 100 for the A in the Mitscherlich equation to represent 100% of the maximum possible yield that can be produced by pushing the effect of any fertilizing material to the limit, and the numeral



0.301 is the Baule coefficient that reduces the specific effects of Mitscherlich's constants "C" to a common denominator. In the Baule equation x stands for the number of pounds an acre of the nutrient that will account for 50% of half of the yield A that might be attained by pushing the use of that nutrient to the limit.

**Using the Baule equation, which is a percentage sufficiency concept, it can be shown that when two or more nutrients or other factors are deficient the final yield will be the product of their relative deficiencies.** For example, a 90% sufficiency of potassium (K) and a 60% sufficiency of phosphorus (P) would permit 90% of a 60% yield or 54% of the maximum yield. Baule also showed that the amount needed for the 50% of a yield was the amount which added to a soil always corrected half of the remaining deficiency. Thus, one unit produced 50%, two units 75%, three units, 87.5%, four units, 93.75% and so on. This amount is referred to as one Baule unit (2) (3) (4).

The reader is referred to the cited literature for more detailed explanations. It is believed that we have shown that Liebig's "law of the minimum" is inadequate for explaining the influences of plant nutrients on plant growth. The concept of the low stave on the barrel is an illustration that is easily understood and appeals to common sense. But its continued use by agronomists and others to explain the relationship between crop yields and fertilizer deficiencies perpetuates a misapprehension of the true facts. As Lang expressed it, the concept is "a cabinet specimen in the museum of rural culture." It was natural enough in its time, when we were still ignorant of the laws of growth; but it has now only a historical interest.

## Stricter Plant Pest

### Control Provided By USDA Ruling

WASHINGTON—New federal regulations providing stricter control over importation and interstate shipment of dangerous plant pests were announced by the U.S. Department of Agriculture.

Full details of the new regulations, which become effective Nov. 24, were published Oct. 24 in the Federal Register. They will affect shipments of biological specimens and other materials by scientists, collectors, biological supply houses, and others.

The regulations extend plant-pest control protection to all plant pests, including insects, mites, nematodes, protozoa, bacteria, fungi, parasitic plants, and viruses, which may be imported into this country for research or other purposes. Previous regulations had applied only to certain injurious insects and mollusks, like snails.

The new regulations, issued under the Federal Plant Pest Act of 1957, regulate entry and interstate movement of all these varieties of plant pests. They apply to the continental U.S., Alaska, Hawaii, Puerto Rico, Guam, and the Virgin Islands.

Permits are required for movement of plant pests into or through the U.S., or interstate. Also authorized are inspection and other regulation of transportation, products, and articles that may carry these pests.

Each application for entry or interstate shipment of a plant pest will be considered on its merits. Criteria are established for issuing or denying a permit.

The regulations include authority to take emergency action under unusual circumstances that cannot be anticipated. Previously such action depended largely upon voluntary cooperation of those interested in the shipments.

Other features include provision for entry of soil under permit, and for safeguards against introduction of plant pests in such soil.

USDA plant quarantine inspectors are also authorized to participate with other agencies to insure safe disposal of foreign garbage, so it will not introduce plant pests.

The Federal Plant Pest Act, approved May 23, 1957, repealed the Insect Pest Act of 1905 and the Molusk Act of 1951. The new regulations issued under the 1957 act will supplement and strengthen USDA activities conducted under the Plant Quarantine Act of 1912 and will replace certain regulations based on the 1905 and 1951 Acts.

## JACKRABBIT OUTBREAK

CORVALLIS, ORE.—Jackrabbit infestations are serious in localized southeastern Oregon areas, an Oregon State College fish and game department biologist reported. Lee W. Kuhn said that the rabbit outbreak is in scattered parts of southern Harney and Malheur counties and a few Lake County districts and farmers in these areas are pushing control measures that were started last August. He emphasized that the infested areas have long been rabbit concentration spots, although this is a year of "increase" in the cycle that has been repeated many times in Harney, Malheur and Lake counties. The U.S. Fish & Wildlife Service and county extension agents started rabbit baiting in the area as early as July and have assisted ranchers in baiting their own lands. Up to \$7,000 from state emergency funds has been authorized to OSC extension service for partial subsidy of a rabbit baiting program, reports J. R. Beck, assistant OSC extension director in charge of inter-agency cooperation.

(1) Spillman, W. J. and Lang E. (1924)—The Law of Diminishing Returns; World Book Co., Chicago.

(2) Baule, B. (1918)—Zu Mitscherlich's Gesetz der Physiologischen Beziehungen, Landwirtschaft, Jahrbuch, 51:363-385.  
(3) Willcox, O. W.—ABC of Agrobiology (1937), W. W. Norton & Co., N.Y.  
(4) Bray, Roger H.—Soil Science, 78:9-22 (1954).

## Alabama Fire Ant Eradication Program Evaluated by Plant-Pest Control Official

MONROEVILLE, ALA. — Evaluating the progress in the local fire ant and insect eradication program, Thomas Lemons, plant-pest control, U.S. Department of Agriculture, recently outlined ways Monroe County farmers may obtain aid in fire ant poisoning.

Mr. Lemons reported a total of 2,050 acres in the eradication area, including all residential areas, has thus far received treatment with granulated dieldrin. The program was initiated here jointly by the Chamber of Commerce, Town Council and the USDA.

Mr. Lemons said the only areas remaining to be treated are woodland and vacant lots planted to crops. Poisoning on these lots will be completed in the late fall.

He said no inspection of treated areas has been made, but his office has received no complaints concerning the continued presence of fire ants.

He estimated that less than one animal per 50 domestic animals and fowl (or wildlife) has died as the result of the poisoning. Deaths reported could not definitely be attributed to the poison without extensive laboratory examination. Dieldrin will destroy all early insects with the exception of nematodes, he said.

The total cost of the local program, around \$15,000, is being supplied by USDA and the town, which passed an ordinance assessing local residents.

Mr. Lemons pointed to three alternative plans farmers may follow if they wish assistance from USDA in fire ant poisoning. He said programs will be developed on a block or community-wide basis and experience has indicated that the cost of treatment approximates \$3 per acre.

The alternatives for farmers listed are as follows:

1. To deposit \$1 with his local com-

mittee for each acre of open land in the treatment area.

2. To apply the insecticide either as a separate operation or in connection with other farm practices to all open land, the insecticide to be supplied to him by the other participating agencies.

3. To defray all expenses connected with the treatment of one third of his open land, the other two thirds to be treated by the other cooperators at no additional cost to him.

Mr. Lemons said the farmer will not be required to participate in the treatment costs of woodland or other long time nonproductive areas. He will be expected to cooperate only in the cost of treating his open lands. The cost of treatment in woodland areas will be shared between the state and federal governments.

He said it is not anticipated that

broadcast treatments will be required to any appreciable extent in wooded areas. In woodlands, ants are found for the most part along roadways and other places of more general exposure to sunlight. It is believed the treatment of such areas will help eliminate the ant from the woodlands.

In the development of block or community programs, the alternatives may be selected on an individual basis rather than on a block basis, Mr. Lemons asserted.

### GATES PROMOTES THREE

DENVER, CAL. — Three promotions have been announced by Charles C. Gates, Jr., vice president of the Gates Rubber Co. They are: H. Benjamin Duke, Jr., manager of industrial relations; Edwin J. Busch, Jr., divisional advertising manager for industrial products, and Warren S. Williams, manager of printing services.

## Armyworms Attack in Texas; Farmer Loses 2/3 Oat Crop

SAN ANGELO, TEXAS — Fall armyworms are making an appearance in several West Texas counties. They are doing some damage to small grain fields, and at least on one farm destroyed two-thirds of the farmer's oat crop. Several landowners have indicated they would not poison the fields but would wait till cooler weather and replant. In this area small grain is planted in the fall and stays green during the winter. Most of the fields are used for winter grazing of sheep and cattle.

The worms will eat anything green, says Ed S. Hyman, local county agent, and it doesn't take them long to do it. Except for their yearly invasion of cottonfields, this is the first time in many years the worms have been found in other crops during the autumn months.

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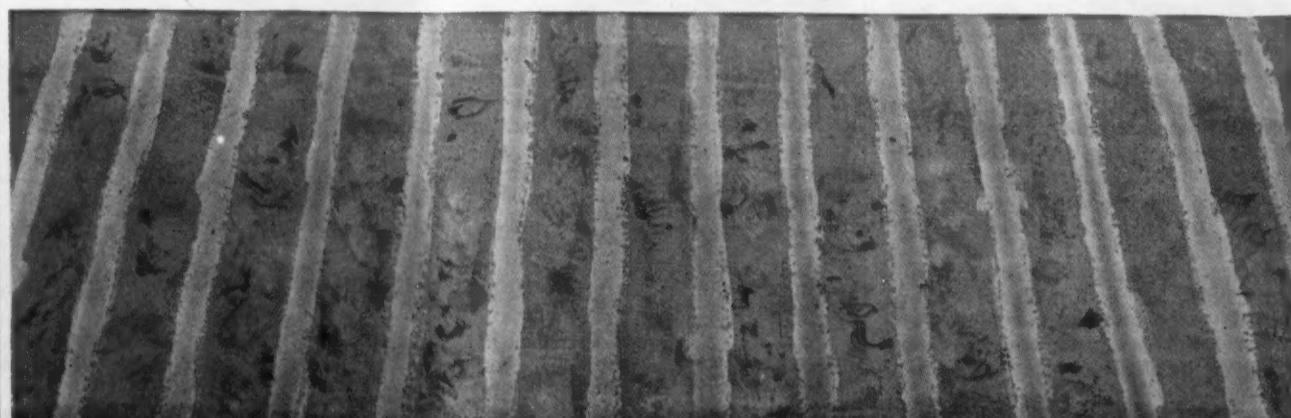
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## Bunker Hill to Build First Fertilizer Plant

SAN FRANCISCO — The Bunker Hill Co. will make its appearance in the agricultural fertilizer trade by mid-1960.

This firm, a producer of various kinds of metals, has announced plans to construct its first fertilizer plant "somewhere in the Northwest," but at an otherwise unspecified location. The plant is expected to be in operation by July, 1960. The fertilizer to be produced will be manufactured from Bunker Hill's own sulfuric acid, which is a by-product of the company's lead and zinc reduction plants located at Kellogg, Idaho.

Present acid production, according to John D. Bradley, president of Bunker Hill, is placed at 100,000 tons a year, and this production can be substantially increased through construction of more facilities for collecting and converting additional waste gases from the reduction plants.

The production of fertilizer, according to Mr. Bradley, is an "important and logical part of the company's planned diversification program."

The plant is scheduled to have an annual capacity of 200,000 tons of fertilizer products, making it one of the largest in the northwestern United States.

The Bunker Hill president emphasized that the \$10 million fertilizer plant was in addition to the company's modernization and expansion programs announced in January of 1957 and currently in progress at Kellogg.

Mr. Bradley said that the plant site would be selected following completion of the company's market and technical surveys.

## PUBLIC RELATIONS

(Continued from page 1)

public at large, and judges are selected from a part of that same public. Judges and juries alike have prejudices, convictions, fears, principles and the same self-interest which exist in the public at large. Both are supposed to be influenced only by the facts and the law, and in general they are; yet the questions of which facts are true and which false . . . do not present a black and white case, but rather a grey area. It is in this area where the bulk of the jury's function falls, and it is here that the general reputation of the parties assume greatest importance."

He summarized his remarks by saying that no amount of press-agentry can substitute for the day-by-day conduct of the representatives of a company. "If a company is to have good public relations it must be a good citizen and all persons associated with the company, from the janitor to president, must act like good citizens in all of their contacts with the public."

The viewpoint of a woman on pesticides and the public was expressed by Dr. C. Westcott, Glen Ridge, N.J., widely known as the "Plant Doctor," she explained that she was appearing as a liaison agent between the university, the manufacturers and the gardening public. In the past, she has given more than a thousand lectures on pest control to garden clubs, rose societies and other groups, translating scientific research into ordinary language.

The problem of overcoming indifference and ignorance is a serious one, she said. For the past year or so, she said, her mail has been concerned largely with questions about the effect of pesticides on human health and on birds and other wildlife. Some of these letters are from individuals, but many are from various leagues and organizations who represent thousands of members who are concerned about the welfare of wildlife.

In one incident, she had been invited to sign a petition to Congress urging legislation "prohibiting the use of any chemical in any phase of food production, processing or marketing unless said chemical, through controlled, recorded scientific research covering at least three generations of mankind has been proven beyond a doubt to be harmless to man, beast and soil." This petition beginning on the premise that poisonous chemicals are used with the "sole purpose of promoting commercial profit and with callous disregard for their gravely adverse effects on the health of consumers."

She added that despite the logic involved to the contrary, many people are discounting research by the U.S. Department of Agriculture and experiment stations because they think such research is influenced by industry wanting to sell chemicals.

The viewpoint of a state commissioner of agriculture was supplied by Phil Alampi who holds that position in the state of New Jersey. He reiterated again that education is the final answer to public relations problems of the industry, pointing out that "a little learning is dangerous" and asserting that the industry has but scratched the surface in this regard. The industry is dealing with lay people who have only a smattering of knowledge in the field of science or no knowledge at all, and many of these folks are unable to comprehend facts, especially when they are presented in a perfunctory manner and in technical terms.

Thus, a lack of knowledge often leaves them suspicious, uneasy,

fearful of the unknown about many things including pest control chemicals.

"Then there are the crusaders, the self-appointed leaders, some of whom are not lacking of knowledge, but who wish to protect animal and plant life as well as their fellow human beings," Mr. Alampi said. The problem is to develop a better understanding of pesticide products and to show how their proper use serves mankind.

A selling job, which needs to be done, is one in which the protection, health, comforts and high standards of living are enjoyed at small cost through the use of pesticidal chemicals.

Getting down to specific cases, the New Jersey commissioner observed that if a better pre-selling of the project had been undertaken before the start of the gypsy moth program, much of the opposition against the program would have been foisted. As it was, the job was done under legal rights, but the deepest resentment built up in the minds of the people of the area will last a long time.

The fact that resorting to operation by edict rather than taking the trouble to foster educational programs, will not work, he asserted. "Consistent repetition of the benefits which chemical pest controls have made available and how they can be used even more extensively with safety, is the only answer," he said.

**A mere favorable decision by the judge in the recent DDT trial in New York does not mean the end of opposition to mass spray programs, the speaker said. "A man convinced against his will is of the same opinion still."**

Public relations problems faced by large firms which spray for control of weeds and other pests was related by Stephen G. Pugh, Southern Bell Telephone and Telegraph Co., Atlanta. He showed copies of booklets and other brochures showing how use of weed killers enhanced the beauty of the landscape even though the first reaction of the herbicide turned the area brown. Allowing the public to know the good purpose of a spray program alleviates possible future complaints, he said.

### Plant Tours to Highlight California Fertilizer School

SAN FRANCISCO—Tours to agricultural chemical processing plants will highlight the two-day Farm Advisors Fertilizer Technology School, to be held on the campus of the University of California at Riverside, Nov. 13-14.

The two day school begins with instruction on the chemistry of nitrogen fertilizer production on Thursday morning, the 13th, and will be followed in the afternoon by tours of both the nitrogen facilities of the Collier Carbon and Chemical Co., Brea, and of the Kaiser coke oven, ammonia and diammonium-phosphate facilities of the Kaiser Steel Corp., Fontana.

Friday's schedule calls first for instruction in the chemistry of phosphorus production, followed by tours of the phosphoric acid production plant of the Monsanto Chemical Co., Artesia; the superphosphate production facilities of the Stauffer Chemical Co., Vernon; and the mixed dry and liquid fertilizer production at Swift and Co., Vernon.

Approximately 40 persons are expected to be enrolled in the school which is a joint sponsorship of the university and of the western regional office of the National Plant Food Institute.

### PROTECTIVE DUSTS, SPRAYS EVALUATED

WASHINGTON—Exploratory studies by U.S. Department of Agriculture researchers were made between 1951 and 1958 on the use of lindane, malathion, methoxychlor, synergized pyrethrum and ryania as insecticides to protect stored corn against rice weevil infestation. Ryania and lindane were dropped from further consideration, and the other three materials are undergoing further large scale evaluation studies, which will be published. Results are to be used as a basis for evaluation studies on a commercial scale. A free copy of this report, "Treatments for the Protection of Stored Southern-Grown Corn from Rice Weevil Attack—Exploratory Tests," Marketing Research Report No. 272, may be obtained from the Office of Information, U.S. Department of Agriculture, Washington 25, D.C.

### Spencer's Net Down; Officers Reelected

KANSAS CITY—Net income of the Spencer Chemical Co. in the first quarter of its fiscal year ended Sept. 30, showed a decrease from the same period a year earlier, largely reflecting narrower margins resulting from lower prices on nitrogen products. Offsetting, to some extent, the nitrogen picture was the continuing growth in plastics, according to Kenneth A. Spencer, president.

Net sales for the quarter were \$11,961,025 up from \$10,719,743 a year earlier. Net income amounted to \$720,008, equal to 52¢ a common share after preferred dividends, compared with \$835,332, or 62¢ a share a year before.

Directors have voted the usual quarterly dividends of 60¢ a share on the common and \$1.05 a share on the preferred stocks, both payable Dec. 1 to holders of record Nov. 10.

At the annual meeting held in the company's offices, the directors and officers who served last year were reelected. The officers are:

Kenneth A. Spencer, president; C. Y. Thomas, general vice president-operations; John P. Miller, general vice president-finance; Joe E. Culpepper, general vice president-marketing; J. C. Denton, vice president-agricultural chemicals division; H. R. Dinges, vice president-industrial chemicals division; E. V. Friedrich, vice president-administration; F. L. Pyle, vice president-plastics division; N. C. Robertson, vice president-research and development; Arthur Mag, secretary; Eugene W. Morgan, treasurer, and J. A. Borders, assistant secretary and assistant treasurer.

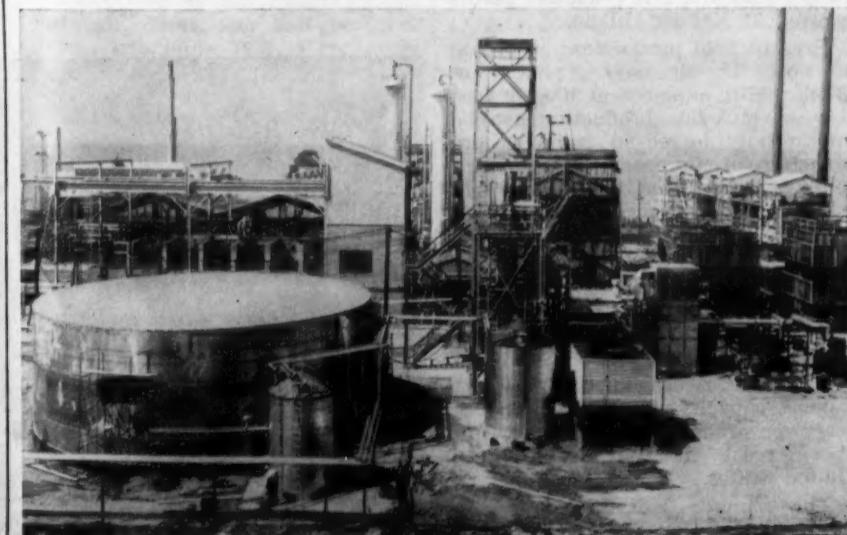


Morton E. Bader

**WHO REPRESENTATIVE**—Morton E. Bader has been named a consultant to the Nov. 19-26 meeting in London of the Committee on Insecticides, World Health Organization. He is the first representative of the American insecticide industry to be consulted by the international agency. Mr. Bader is insecticide quality control manager for the chemicals division of Olin Mathieson Chemical Corp. He worked for the United Nations Children's Fund (UNICEF) earlier this year in Iran, where he demonstrated to the Iranian Government the effective handling and use of DDT wettable powders in malaria control. Mr. Bader has been named for the mission as the result of an industry-wide search by UNICEF. The meeting, at the Tropical Products Institute, will consider the specifications and chemistry of pesticides. Included on the agenda are a review of specifications for technical products and the consideration of current specifications for DDT 75% wettable powders.

### APPOINTMENT ANNOUNCED

NIAGARA FALLS, N.Y.—The board of directors of Hooker Chemical Corp., Niagara Falls, named Thomas E. Moffitt, Hooker president, to succeed R. Lindley Murray as chief executive officer of the company. Mr. Murray has held the office since October, 1955, and Mr. Moffitt was elected president of the company on Nov. 20, 1957. Mr. Murray has agreed to continue as chairman of the board, a position he has held since June, 1951, and plans to remain in active service until Dec. 1, 1959, as previously requested by the board.



**NEW UREA PLANT**—New urea-producing facilities at Hercules Powder Co.'s plant in Hercules, Cal., are now in commercial production, with a capacity of 20,000 tons a year. Principal end use for the urea will be in "UN-32" high-nitrogen-yield liquid fertilizer. Seventy-five per cent of the new plant's production will be for agricultural use, and the remaining 25% will be used largely in the manufacture of urea formaldehyde resins required by the plywood and particle board industry. A feed-grade urea will also be available for cattle feeds.



OPEN HOUSE SCENES—When Dairyland Fertilizers, Inc., of Marshall, Wis., held its grand opening some 200 farmers, University of Wisconsin agriculture experts and friends visited. The picture at left shows the mayor

of Marshall raising the American flag above the new plant. In the center photo, visitors were treated to a free lunch at the Marshall high school gym. The photo at right shows Prof. K. C. Berger loading the first bag of fertilizer.

## Iowa Firm Sponsors Annual Youth Trip To North Woods

Ellis J. Mueller, president of the F. Mueller & Sons, Grand Mound, Iowa, sponsors an annual outing in the Canadian north woods which builds much good will for the firm. The recipients are 4-H boys and girls.

The feed firm, which has a mill at Grand Mound, and seven feed stores in the area, sponsors one trip each year for the 4-H girls and one for 4-H boys. Mr. Mueller has charge of each trip, and he uses a trailer outfit which sleeps six people.

When the 4-H girls are taken, Mr. Mueller's daughter accompanies them. Mr. Mueller estimates that a week's trip can be made with the trailer outfit, including meals, for about \$100. The firm has been conducting this trip for eight years. Local newspapers usually feature pictures and stories about the program on front pages annually.

4-H leaders in the various areas choose the boys and girls who are to make the trips, and there is considerable competition as a result. Pictures of the winners appear annually on bulletin boards at the various Mueller stores.

The popularity and continuity of this program suggest that other feed firms can profitably engage in a similar or related promotion directed toward the 4-H movement.

By AL P. NELSON  
CropLife Special Writer

When a group of professionally trained men in the agricultural field decide to pool resources and open a fertilizer manufacturing business, one can usually expect a very sound approach in sales and service.

That proved to be the case in the opening of Dairyland Fertilizers, Inc., Marshall, Wis. Since its opening day, the company has been forging steadily ahead and is moving a fine volume of fertilizer. Ray Pavlak, president, says that 60% of the firm's output to date is in bags, the rest in bulk.

The merchandising slogan for the company is one which farmers remember and frequently think about. It is "We Want to Sell You a Crop. Let Us Test Your Soils and Then You'll Know What Crops You Are Going to Plant on Specified acres. Then We Can Help You Get the Best Crops from Your Soils."

Mr. Pavlak is a former vocational ag school instructor and also a former county agent. Since 1944 he had been with another fertilizer company as Wisconsin manager and helped them to build five plants in the state. He is a soils and agronomy graduate from the University of Wisconsin, and when he tries to sell fertilizer to a

customer, he thinks in terms of profitable yields for customers, he says. This approach is appreciated by numerous customers.

Mr. Pavlak also owns and operates a 285 acre farm at nearby Deerfield. Here he raises dairy cows, hogs and beef cattle. He has 42 milking Holsteins, 120 acres in corn and the rest in alfalfa and pasture. He knows farming from various angles, and thus is in an excellent position to help farmers with their soil fertility problems. It is not unusual to find a number of men in the plant office chatting about fertilization problems with Mr. Pavlak or other officers of the company.

For instance when the farmer says that he had a bumper alfalfa crop, Mr. Pavlak will tell him that alfalfa takes out four times as much potash from the soil as it does phosphate. Therefore, the farmer quickly grasps the idea that his next fertilizer should contain considerable potash. This kind of direct, specific information on crops, gained through Mr. Pavlak's work as vocational ag instructor, and county agent, comes in very handy in selling fertilizer.

James B. Harker, vice president, is also a former agricultural class instructor in Wisconsin. He owns three farms, all run by tenants. Eugene Sommers is the assistant treasurer.

Thus it can easily be seen that these three men have a great deal of fertilizer and agricultural know-how which can be used to operate a fertilizer business profitably.

Mr. Pavlak states that farmers are using the following grades of fertilizer for corn land in this section of Wisconsin: 6-24-24, 6-24-12, 5-20-20, 4-12-36 and 12-12-12. For pastures many farmers are using 12-12-12.

Mr. Pavlak likes to visit farmers and talk with them about their use of fertilizer, their opinions about yields, and other timely topics. In this way he is able to learn much about current fertilizer practices, especially in this area.

"What's the fertilizer to be used for?" is a question he and his men always put to farmers who show interest in buying. In answering, the farmer gives information which Dairyland Fertilizer officials often can use to make certain that the

customer gets the type of fertilizer best suited to his land.

The company tests soil at its own lab, and also sends some to the state lab. It places a great deal of emphasis upon the importance of soil tests. In some types of low land, the officials of the firm advocate the use of fertilizers with some trace elements, and



THE PRESIDENT AND HIS MRS.—Ray Pavlak and his wife of Dairyland Fertilizers, Inc., in Marshall, Wis. The picture was taken during the firm's grand opening celebration.

this has worked out very well for many customers having that type of soil.

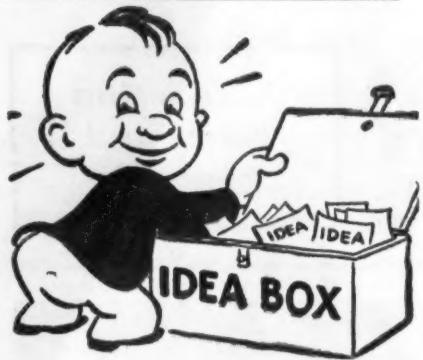
"We keep records of the types of fertilizer customers purchase, the results they get," says Mr. Pavlak, "thus we have a case history of their use of fertilizer. This will be very helpful to us in the years ahead, for we can gradually work up the use of larger amounts of fertilizer in line with soil test recommendations."

As a county agent, Mr. Pavlak was well aware of the importance of proper publicity and advertising for a new plant or policy. Therefore, when his firm's new plant opened in a former dairy plant building, he had a dedication day program which attracted much attention.

More than 200 farmers attended, as (Turn to EXPERTS, page 11)



AT CONVENTION—Among the suppliers present at the 15th annual convention of the Florida Fruit & Vegetable Assn. held in Miami Beach, Fla., recently were Richard Acree (left), Orlando, Fla., sales representative for California Spray-Chemical Corp., and Tom Criswell, Marlin, Texas, sales representative for Velsicol Chemical Co.



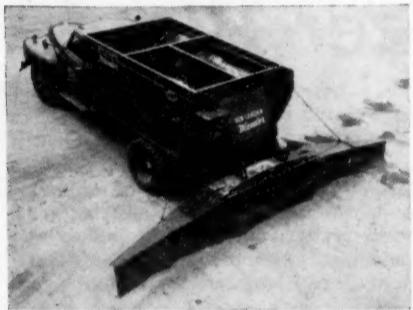
## What's New...

### In Products, Services, Literature

You will find it simple to obtain additional information about the new products, new services and new literature described in this department. Here's all you have to do: (1) Clip out the entire coupon and return address card in the lower outside corner of this page. (2) Circle the number of the item on which you desire more information. Fill in your name, your company's name and your address. (3) Fold the clip-out over double, with the return address portion on the outside. (4) Fasten the two edges together with a staple, cellophane tape or glue, whichever is handiest. (5) Drop in any mail box. That's all you do. We'll pay the postage. You can, of course, use your own envelope or paste the coupon on the back of a government postcard if you prefer.

#### No. 6818—Mobile Blender

The Highway Equipment Co. announces the "New Leader L-42S Mobile" Blender. The unit will blend and spread three fertilizers at the same time, the company says. The spreader operator can change the fertilizer ratio for varying soil conditions, as determined by soil tests,



while in the field. Three separate feedgates, each with a test box for metering, control the amount of spread, the company says, and a 7 h.p. engine drives the distributor fan assembly at a constant rate, regardless of truck speed. For more details check No. 6818 on the coupon and mail to this publication.

#### No. 7229—Liquid Tote Tanks

Tote System, Inc., announced the inclusion of a 300-gal. capacity Tote tank in the "Trial Rental Program" instituted by the firm last spring. The tanks are usable for any liquid material and have eliminated the 55-gal. drum in a number of industrial applications, the company said. For further details, check No. 7229 on the coupon and mail to this publication.

#### No. 2053—New Bag Concept

A single-gusset, sewn-valve multiwall bag which the manufacturers say is a new concept in bag construction, has been developed and introduced by Bemis Bro. Bag Co. Designers say the single-gusset is difficult to distinguish from the two-gusset multiwall when filled, but that it stacks uniformly and can be easily palletized. Advantages cited include additional usable space created by the flat tube side, more room for product flow during filling, and reduction of blowouts. Products fed into the bags do not back up and clog the filler spout, cutting packaging time and labor. Extra space provided by the flat tube side often permits utilization of a shorter bag and consequent



reduction of the manufacturing cost of bagged products, according to Bemis officials. For more information check No. 2053 on the coupon.

#### No. 6819—Boomless Fertilizer Sprayer

The Broyle Co. announces a new low clearance, boomless fertilizer sprayer designed for fast application of liquid fertilizer. The unit is ideal, the company says, as a rental piece. The sprayer has no boom pipes and the low silhouette prevents tipping on rough terrain, the company says. The unit will spray a 35 ft. swath. The trailer is of I beam construction with Timken Hi-Speed wheels. The tank is of steel with a 2-in. filler



opening and a 270-gal. capacity. For more information check No. 6819 and mail.

Send me information on the items marked:

- No. 2053—New Bag Concept
- No. 6803—Air Shipments
- No. 6805—Tree Control Bulletin
- No. 6810—Pesticides Book
- No. 6811—Turfgrass Manual
- No. 6812—Manufacturers' Handbook
- No. 6813—Revised List
- No. 6814—Pump Data
- No. 6815—Trailer Sprayer

(PLEASE PRINT OR TYPE)

NAME .....

COMPANY .....

ADDRESS .....

CLIP OUT—FOLD OVER ON THIS LINE—FASTEN (STAPLE, TAPE, GLUE)—MAIL

FIRST CLASS  
PERMIT No. 2  
(Sec. 34.9,  
P. L. & R.)  
MINNEAPOLIS,  
MINN.

BUSINESS REPLY ENVELOPE

No postage stamp necessary if mailed in the United States

POSTAGE WILL BE PAID BY—

Croplife

P. O. Box 67

Reader Service Dept.

Minneapolis 40, Minn.



#### Also Available

The following items have appeared in the What's New section of recent issues of Croplife. They are reprinted to help keep retail dealers on the regional circulation plan informed of new industry products, literature and services.

#### No. 7165—Bagging Scale Bulletin

The Richardson Scale Co. has published a bulletin describing its E-50 automatic bagging scale. The six-

page, two-color bulletin, with illustrations and cut-away line drawings, details the E-50's design, capacities, gravity or power feed operation, and discharge. In addition, the bulletin contains engineering drawings, illustrations of suggested feeding arrangements and descriptions of accessories. Standard specifications and optional features are outlined, along with the E-50's ability to handle a variety of materials. A copy of the bulletin may be obtained by checking coupon No. 7165 and mailing to Feed-stuffs.

#### No. 7175—Gas Equipment Brochure

A description of the line of packaged inert gas producing equipment manufactured by Southwest Industries, Inc., is contained in a four-page brochure published by the company. In it are included inert gas generators, nitrogen generators, carbon dioxide generators, carbon dioxide removal units, gas purifiers, gas drying equipment, and compressors and storage systems. These units are used in a large number of industries, including grain storage. Check No. 7175 on the coupon and mail.

#### No. 6805—Tree Control Bulletin

Michigan State University is offering information on controlling insects and disease on ornamental trees. The bulletin was compiled by the entomology, horticulture and botany and plant pathology staff members at MSU and it lists descriptions of pests and their injuries on about 25 different trees. Recommendations for kinds of control materials to use are also included. Interested persons may write to the Cooperative Extension Service Bulletin Office, Michigan State University and ask for bulletin No. E269.

#### No. 6811—Turfgrass Manual

A guide to fertilizing various turfgrass areas, entitled "Superintendents' Turfgrass Manual" has been published by Nitroform Agricultural Chemicals. The booklet contains a chart on the "Range of Nitrogen Feeding" and also information on supplemental feeding. For details, check No. 6811 and send to this publication.

#### No. 6814—Adjustable Pump Data

Operating data on the ACAP pump for handling liquids or hygroscopic solids in suspension under variable capacity and head requirements are contained in new literature released by Allis-Chalmers. Standard requirements of the ACAP pump as compared to a standard pump with valve controlled discharges are noted in the bulletin, which includes range and power savings charts. For more information, check No. 6814 on the coupon and mail.

#### No. 6812—Manufacturers' Handbook

A "Manufacturers' Handbook" which was designed as a technical reference text for students and teachers is now available from Nitroform Agricultural Chemicals. Charts on nitrification are included to aid in understanding of the chemical and agronomic properties of good urea-forms. Check No. 6812 on the coupon and mail.

#### No. 6817—Suspension Material

Carbopol, a material which will suspend particles in a solution, has been announced by the B. F. Goodrich Chemical Co. The material can be used in various herbicides and other agricultural wettable powders. According to the company as little as .05% Carbopol, based on the weight



## No. 6810—Pesticides Booklet

"Your Ready-Reference Guide to Dependable Diamond Weed and Brush Killers for Effective, Easy, Economical Weed and Brush Control" is the title of an illustrated, 12-page booklet just issued by the Diamond Alkali Co. Briefly reviewed in this catalog are the Crop Rider, Fence Rider, and Line Rider groups of Diamond herbicide formulations. Application areas suggested in the booklet include farms; highways, secondary and rural roads; public utility lines; railroad, pipeline and other rights-of-way, and factory sites, plant grounds and other industrial areas. Check No. 6810 and mail for details.

of the total mixture, will retard settling and eliminate the formation of a hard cake. Its use for suspension in insecticides, herbicides and fungicides eliminates the need for repeated shaking. In addition, the company claims, Carbopol acts as a binder to adhere the particles to the foliage. Check No. 6817 on the coupon and mail for details.

## No. 6820—Soil Conditioner Booklet

A booklet on "Dextran and Dextran Products as Soil-Conditioning Materials" has been prepared by the Commonwealth Engineering Company of Ohio. The illustrated publication contains data on dextran-treating experiments, plus tables, graphs and photographs of actual tests. For more details check No. 6820 on the coupon and mail to Croplife.

## No. 7193—Vacuum Barrel Handler

A barrel handling unit, attached to a fork lift truck and capable of lifting four 55-gal. steel drums each weighing 490 lb., has been designed and produced by Vac-U-Lift Co. The source of power for this unit is a



hydraulic, motor-driven vacuum pump which operates in conjunction with the regular hydraulic system of the fork lift truck. Each unit is equipped with a dashboard panel control which allows operators to lift or release up to four barrels collectively, individually or in any combination. Check No. 7193 on coupon and mail to secure more details.

## No. 6816—Testing Machine

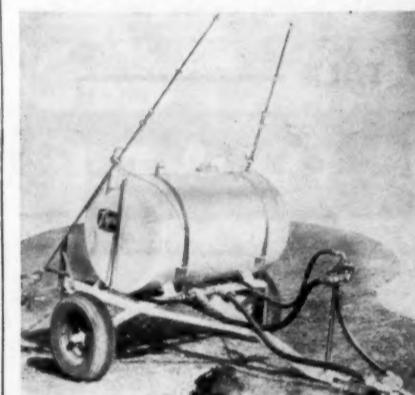
Kohl Enterprises, Inc., Aquafil Division, announces a specially designed arbor press, in combination with a mechanical force gauge, for testing the compression of a given sample of fertilizer. After breaking the same sample, the machine will check the anti-caking ability of the sample over long time storage. For further details, check No. 6816 and send to this publication.

## No. 6803—Air Shipments

ParcelAir, a method of shipping fertilizer and farm chemicals by air with one to three-day service, has been started by American Shippers, Inc. The service will ship packages of any dimension up to 40 lb. anywhere in the U.S. For further details check No. 6803 on the coupon and mail it. Please print or type name and address.

## No. 6815—Trailer Sprayer

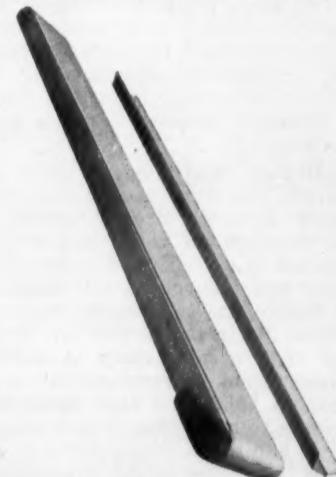
Simplicity, large capacity, low cost and versatility were the features Tryco Manufacturing Co., Inc., says it has tried for in the firm's 1959 line of fertilizer sprayer equipment. The trailer sprayer has a 300 gal. steel



tank, 1 1/4 in. PTO pump system and a 33 ft. stainless steel boom assembly. For more details, check No. 6815 on the coupon and mail to this publication.

## No. 7169—Belt Conveyor

A new conveyor is being marketed under the name of Perta-Veyor by Bunke-Musser, Inc. The drive unit of the equipment is completely enclosed in the conveyor, eliminating chain drives and guards on the outside. It can operate flat on the ground and up to a 30 degree angle. It is being manufactured in a variety of



lengths and belt widths, and has a load capacity of 400 lb. Belt speeds can be adjusted to as low as 15 ft. per minute. Literature and prices are available by checking No. 7169.

## No. 6813—Revised Products List

A newly revised chemical products list titled "Hooker Chemicals," has been published by Hooker Chemical Corp. The bulletin contains five chemicals which have recently been made available for general sale on a commercial scale. A description, chemical formula, physical data, uses and types of shipping containers are detailed for each of the 65 chemicals listed. Check No. 6813 on the coupon and mail for details.



Unload fertilizer in the rain? Sure—if it's Spencer "Mr. N" Ammonium Nitrate in the new weather-proof bag. (See complete story below.)

### New from Spencer Chemical Company . . .

## Fertilizer In An All-Plastic Bag That Farmers Can Re-Use!

### Spencer "Mr. N" Ammonium Nitrate now comes in a plastic bag you can store right out in the open:

First to give you prilled fertilizer for easier application . . . first to give you polyethylene-lined bags to stop caking . . . Spencer Chemical Company now brings you the most important new development in fertilizer packaging since the switch to paper bags 18 years ago!

#### Completely New Kind of Bag

The new Spencer "Mr. N" Ammonium Nitrate bag is made entirely of polyethylene plastic. This 50-pound bag keeps ammonium nitrate drier than any other bag made! In fact, polyethylene bags of Spencer "Mr. N" are so weathertight that even a drenching rain can't get inside.

#### Makes Storage Easy

Storage space is never a problem with these new bags, because farmers can unload and temporarily store them right in the field. Dealers use porches and cribs for storing rain-proof bags of Spencer "Mr. N." Some even build a protective wall of plastic "Mr. N" bags on a covered porch and

store paper bags of fertilizer behind it!

#### Re-Use After Empty

When the bags are empty, your customers will use them to store seed or small tools, cover windows, or insulate buildings. Or, they can heat-seal the bags together to form a giant sheet of polyethylene. Twenty-four plastic "Mr. N" bags heat-sealed together make a tractor cover. A ton of "Mr. N" provides enough bags to make a tarpaulin big enough to cover a haystack!

Thousands of farmers have expressed great interest in the new bags as shown at recent state fairs throughout the Midwest and South.

With each shipment of "Mr. N" in these new bags, Spencer will send you free announcement ad mats and copies of the folder, "How to Re-Use Plastic Fertilizer Bags." Also, your own announcements will be backed by big Spencer "Mr. N" ads in leading farm magazines.

#### More Information Free

To see many of the ways farmers can re-use the plastic "Mr. N" bags, and to get a free sample of these remarkable bags, use the coupon below. Or, still better, be the first in your territory to offer "Mr. N" in these revolutionary new bags. Place your order now through your manufacturer's representative.

## Tear Off and Mail This Coupon Today! ▼

Spencer Chemical Company  
536 Dwight Building  
Kansas City 5, Mo.

At no cost or obligation to me, please rush the items checked below:

Sample polyethylene bag.  Booklet, "How To Re-Use Plastic Fertilizer Bags."

Name . . . . .

Address . . . . .

City . . . . . State . . . . .

Name of manufacturer from whom I buy fertilizer . . . . .

## EXPERTS

(Continued from page 9)

did many officials of the University of Wisconsin agriculture department. These latter included Prof. O. J. Attoe, Prof. C. J. Chapman and Prof. K. C. Berger. Each of these professors took part in the program.

Prof. Chapman spoke on "Cutting Milk Production Costs by Fertilizing the Pastures," and also used colored movies.

"Minor Elements in Your Fertilizers Can Pay Big Dividends for Corn—Canning Crops—Alfalfa," was discussed by Prof. Berger.

"Get the Most from Your Fertilizer Dollar Through Soil Testing" was Prof. O. J. Attoe's subject.

In addition the mayor of the city welcomed the new industry to town. Mr. Pavlak also spoke. A free lunch was served to everyone attending in the local high school gym.

In such programming, perhaps many a fertilizer dealer will get an idea on how to add drama to his annual open house or other event. This Wisconsin firm has shown that it can be done effectively.

Another step which Mr. Pavlak took to make his firm better known was to visit country weeklies in his area. He told them of his qualifications concerning agriculture and asked them if they would like to have a free weekly agriculture column written by him. He signed up four weeklies on this idea. Now he writes one column per week, which is distributed to these four newspapers. The publicity and advertising which Dairyland Fertilizers, Inc., secures through these columns is considerable. Many farmers mention to Mr. Pavlak that they read these columns regularly.

Undoubtedly this is an idea which many other fertilizer dealers can use.

Recently, to celebrate his 50th birthday, Mr. Pavlak offered to give fertilizer customers free spreading. The first 50 farmers who placed a minimum 2 ton order got the free spreading. The event was advertised by means of a special circular. The copy read in part:

To celebrate the 50th birthday of the president of Dairyland we are giving free bulk spreading to the first 50 orders.

As the first crop of hay is very short this year, every farmer will need to top dress most of his new and old alfalfa seedings. Use Boron with fertilizer at least once in the rotation.

DAIRYLAND FERTILIZERS, INC.  
Phone 5-2621  
Marshall, Wis.  
Manufacturers of  
BIG D—High Water Soluble Granular Fertilizers

PERMIT  
No. 2  
Marshall  
WIS.  
BOXHOLDER  
RURAL ROUTE  
WIS.

## FREE BULK SPREADING

To celebrate the 50th birthday of the President of Dairyland we are giving FREE BULK SPREADING to the first 50 orders.

As the first crop of hay is very short this year, every farmer will need to top dress most of his new and old alfalfa seedings. Use Boron with fertilizer at least once in the rotation. We recommend 0-10-40B or 0-14-42.

Much of the alfalfa in Wisconsin suffers from lack of available Boron in the soil. Because of this, yields are often low and winter killing is more severe. It only costs about 95¢ an acre to add Boron to your top dressing fertilizer.

To qualify for FREE SPREADING, an order must be for at least 2 tons per farm spread at the rate of at least 300 lbs. per acre.

If there is not a BIG D fertilizer dealer in your community, call us collect and place your order.

DAIRYLAND FERTILIZERS, INC.  
Phone 5-2621 Marshall, Wis.  
RAY L. PAVLAK, Pres. & Gen. Mgr. JAMES S. RANKIN, Vice Pres. EUGENE S. BORRELLI, Asst. Pres.

**50TH BIRTHDAY AD**—When Dairyland Fertilizers' president, Ray L. Pavlak, celebrated his 50th birthday, he tied in the event with a special promotion, offering free bulk spreading to the first 50 farmers who bought two tons of fertilizer.

tion. We recommend 0-10-40B or 0-14-42.

"Much of the alfalfa in Wisconsin suffers from lack of available Boron in the soil. Because of this, yields are often low, and winter killing is more severe. It costs only about 95 cents per acre to add Boron to your top dressing fertilizer.

"To qualify for free spreading, an order must be for at least 2 tons per farm, spread at the rate of 300 lb. per acre or more."

This fertilizer firm, too, is going to push fall plowdown fertilizer, states Mr. Pavlak. He plans to have dealer and customer meetings, quite a few newspaper ads and also will work with dealers on county fair exhibits.

This fertilizer plant is geared at present for a capacity of from 6,000 to 8,000 tons. The firm sells direct to consumers around its home site, but has some dealers elsewhere.

"We are working hard on our program of selling the farmers a crop—not just fertilizer," states Mr. Pavlak. "We feel that once the farmer understands the soil fertilization problem from many angles, then he will be able to buy fertilizer more wisely for his greatest benefit."



## FARM SERVICE DATA

Extension Station Reports

The root-rot complex, affecting practically all vegetable crops in south Florida, has become progressively worse during the past several years, especially on the sandy soils of the lower East Coast. Without question, weather conditions have influenced this condition to a large extent, but cropping systems have been equally important, according to the University of Florida agricultural experiment station.

During recent years many farmers have resorted to growing summer cover crops to provide humus and at least some of the plant food. But in order to get maximum yields the crops have been allowed to grow until late August or the first of Sep-

tember before plowing under. This delay required the cover to be incorporated into the soil in a green state, thereby encouraging the multiplication and rapid growth of the principal soil-borne parasitic fungi which are associated with the root-rot disease. The inadvisability of this practice was pointed out by Tisdale and Moore (Circular S-75) in 1954.

Subsequent to the publication of Circular S-75, a series of experiments was started at the Plantation Field Laboratory, Fort Lauderdale, to determine the effects of different materials, when added to sandy soil, upon the incidence of both rhizoctonia and pythium species, the most important genera of organisms associated with the root-rot complex.

Preliminary tests were made in pot experiments. Sterile sandy soils were inoculated with pure cultures of the respective fungi, followed by additions of different types of air-dry organic matter. Two seasons' results indicated that additions of most dry organic materials caused significantly less infections on snap beans by both rhizoctonia and pythium than where no additions were made. Of the materials tested, dry hay and finely divided bagasse proved best from a workable standpoint, although not significantly better than the other materials.

In 1956 a field plot experiment was started in which replicated plots of equal size were treated as follows: Bagasse added at rates of 5,000 pounds and 2,500 pounds per acre; dry hay, similar rates; fallow; and normal cover whichever was plowed under in the green state. All dry materials were incorporated into the soil four weeks or more before planting. Snap beans were used as the test crop, and equal amounts of seed were planted to each row.

Readings were made on total germination, post-emergence damping-off, stem-lesion infections and—where possible—bean yields. Original plans were to start a new series each year until three had been completed, then continue all for three or more years to cover as many weather factors as possible. Unfortunately this could not be done.

However, the accumulated data through the current year indicate results of considerable importance. The combined data on the first series, which had received annual organic additions for three years, indicated that post-emergence damping-off was significantly higher on non-treated plots, stem-lesion infections showed similar readings and final yields were larger on the treated plots (one season's results). There were slight, but not significant, differences in favor of the 5,000-lb. applications as compared to the 2,500. There was also a slight difference in favor of bagasse over dry hay. The fallow plots were consistently worse than the treated in all respects.

In the light of the results shown in Circular S-75, where green organic matter was added to the soil shortly before planting beans, present results seem to be particularly important. These results suggest that the practice of plowing under green cover crops immediately before planting is not desirable for the lower east coast, covers are advantageous if used in a dry state, and where used in a dry state the incidence of both rhizoctonia and pythium can be reduced and yields are likely to be increased materially.

## SHOP TALK

## OVER THE COUNTER

By Emmet J. Hoffman  
CropLife Marketing Editor



Dealers who are perplexed by low profit lines may find that their gross profit is too small or the inventory turnover too slow.

If the gross profit margin is too small, the dealer can raise it by increasing selling prices, by purchasing more effectively, or if necessary by changing brands or types of products in the line.

The way to increase turnover generally is to cut down average inventories either by careful purchasing, by eliminating slow moving items from stock, or by reducing the total number of items carried in the line. Or the way to make the line more profitable may be to increase sales volume through more effective advertising, displays or

When a large inventory is a problem, the dealer has one of four possible steps open to him.

**1. Order more carefully.** Sometimes average inventories can be cut down by watching sales carefully and ordering accordingly. Inventory turnover for the line as a whole can be increased by ordering only the quantity of each product within a line which is expected to be sold promptly. Seasonal sales patterns for previous years as well as recent sales experiences provide very helpful guides for replacing wholesale orders more carefully.

**2. Reduce time between order and delivery.** The size of the inventory needed depends directly upon the time required to get delivery after the order is placed. So anything that can be done to reduce this time lag will reduce the inventories required. Telephoning in the orders can help a great deal in some cases. A shift in transportation arrangements may speed up delivery. And sometimes changing to a supplier who is nearby or who can make faster delivery will enable the dealer to cut down inventories.

**3. Discard slow moving items.** Another way to reduce average inventories is to clear out and discontinue slow moving items within the line. A check back against sales records will reveal these particular items which are slowing down the inventory turnover for the whole line. The most profitable thing to do is to discontinue handling such items altogether.

**4. Reduce the number of items in the line.** Often dealers build up average inventories by carrying too many items within a line. Ordinarily it is more profitable to concentrate on one brand rather than three or four. Frequently, also, it pays to eliminate all but the most popular sizes, qualities and types within the one or two

(Turn to **SHOP TALK**, page 14)

eral Motors. I didn't know you did so much business."

"Don't believe all you see!" snapped Oscar. "We ain't collected on all of it. Ach, I wish we hadt. And you should see our expenses."

"By golly, Oscar, I know us farmers bellyache all the time even if times are good. That's a habit. But you bellyache mor'n we do. You're the champ."

"Somebody has to bellyache aroundt here!" Oscar thundered angrily. "Somebody has to try to get sense into bull heads."

Hampton looked thoughtful. "Hey, those pictures show you guys spreadin' fertilizer even with snow on the ground. Was that taken last fall?"

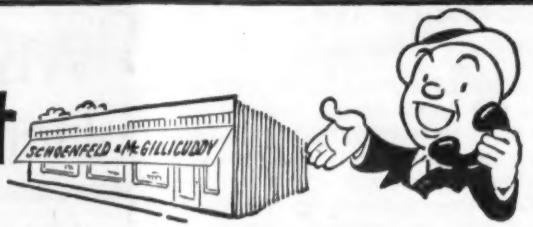
"Yah," Oscar said. "You shouldt know how much money Pat wastes taking pictures of people and spreading. Himmel!"

"Well, it ain't too late then for me to spread," mused Hampton.

(Turn to OSCAR & PAT, page 14)



## Doing Business With Oscar & Pat



It was a cool fall day and Oscar was wearing his four-year-old felt hat for the first time this season, and also his button-up-the-front sweater, which Minnie had dyed a dark blue from a sickish, worn black.

Oscar inserted his key into the front door lock, and with a selfrighteous, pleased look on his face, shoved the door in and stepped inside. Always the first to work in the morning, it gave him a decided sense of superiority.

"Minnie," he often said at breakfast, "I don't see why people like to sleep late in the morning. Ach, that is where they lose time and money. I like to get to work early—ahead of everyone else."

Now Oscar went around the salesroom inspecting everything, to see what was new, if anything, over and above what he had observed at closing time the day before.

His eyes suddenly popped wide open. "Himmel, what has happened?" he exclaimed.

On the wall near Tillie's desk he saw about seven or eight 8 by 10 black and white glossy photos thumbtacked to the wall. The pictures showed bulk fertilizer being spread on customers' farms, and neatly typed strips of paper below each photo named the farm, the rate of application, etc.

"Ach, more of that Pat's work!" grumbled Oscar. "Big pictures like that—they cost a lot of money."

Now he turned to the railed-in enclosure that separated his desk and Pat's from the big salesroom. As he stepped through the swinging gate, his glance fell on the wall between the spot where his desk and Pat's stood.

"Ach du Lieber!" Oscar slapped his hand to his forehead, as he saw at least 10 more pictures thumbtacked on the wall. These pictures showed bulk fertilizer being spread while snow was on the ground. Also there were a few pictures showing anhydrous ammonia being applied on dry ground. A note under these latter pictures said that anhydrous had to be applied before the ground got too cold.

Ann Hydrous, the black and grey cat sleeping atop the safe, opened sleepy eyes and looked at Oscar quizzically, as though sensing his mood.

"Yah, you!" yelled Oscar angrily. "You sleep all day and Pat sleeps all morning. Ach, such a business. I wish one of these days Croplife would print a classified adt about some dealer who wants to sell a business cheap—real cheap."

Suspiciously Oscar lifted his eyes and looked around the salesroom. Sure enough, here and there appeared more 8 by 10 photos spread around on the walls, each with identifying typed strips below them.

"Himmel, we will make no profit this week with all them expenses!" Oscar cried. "That Irisher's middle name should be 'SPENDT.' That's all he knows."

Now, with the stealthiness of a teacher creeping up on mischievous students, Oscar got up slowly from his desk and made his way toward the door separating salesroom from warehouse. Out there he walked around a little, then let out a whoop.

"More pictures! Has he gone crazy? All this he does nights when he shouldt be home. Why can't he work daytime like me?"

Muttering to himself Oscar went

back to his desk and furiously attacked some discount work. But he was so angry he got fouled up on his figures quite often, which made him still angrier.

Even when Tillie Mason came to work and greeted him cheerfully, Oscar merely grunted. Tillie made a face. Oscar was like that again. He was often like that. Well, it took all kinds of people to make a world. She shrugged and settled down to work.

Along about 9:30 a heavy set farmer named Gil Hampton came in from the warehouse.

"Gee, Oscar, you fellows must be makin' a barrel of dough," he said with a grin.

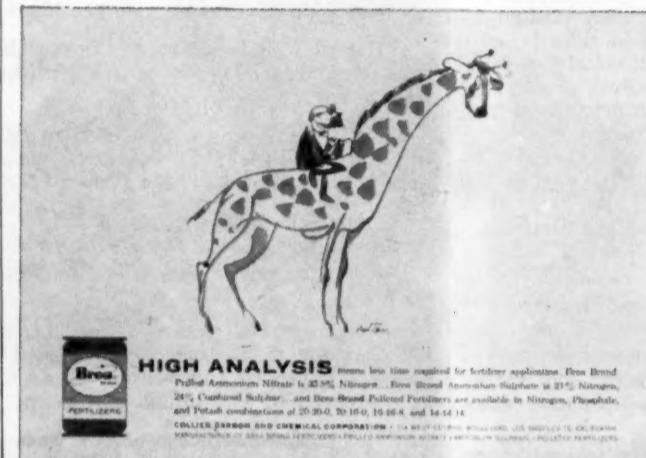
"We are not makin' nottink," Oscar thundered, as he whirled around. "Spendt! Spendt! Spendt! That's all we are doink aroundt here!"

"Who, you? I don't believe it."

"No, not me—that Irisher!" sputtered Oscar.

"Well, something is rotten in Denmark," commented Hampton. "From the looks of all them pictures posted on the warehouse walls, it looks like you fellers is running neck and neck with Gen-

## Who Says Dry Fertilizer Makes "Dry" Reading?



**HIGH ANALYSIS** Even less time required for fertilizer application. Brea Brand Prilled Ammonium Nitrate is 33.5% Nitrogen. Brea Brand Ammonium Sulphate is 21% Nitrogen, 26% Calcium Sulfate, and Brea Brand Pelleted Fertilizers are available in Nitrogen, Phosphate, and Potash combinations of 20-10-0, 20-10-0, 10-10-6 and 14-14-4.

COLLIER CARBON AND CHEMICAL CORPORATION • 111 WEST OLYMPIC BOULEVARD, LOS ANGELES 15, CALIFORNIA  
MANUFACTURERS OF BREA BRAND FERTILIZERS • PRILLED AMMONIUM NITRATE • AMMONIUM SULPHATE • PELLETED FERTILIZERS



**FREE FLOWING** Brea Brand dry fertilizers are easy to apply by ground rig, airplane or in irrigation water. These high-analysis dry fertilizers come in convenient 50 pound bags.

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MANUFACTURERS OF BREA BRAND FERTILIZERS • PRILLED AMMONIUM NITRATE • AMMONIUM SULPHATE • PELLETED FERTILIZERS



**EASIER TO HANDLE** 50-pound bags make Brea Brand dry fertilizers convenient to use. These high-analysis bags are available for quick delivery all year long. And you can order less than 24-hour shipment by rail or truck—direct to fieldside!

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MANUFACTURERS OF BREA BRAND FERTILIZERS • PRILLED AMMONIUM NITRATE • AMMONIUM SULPHATE • PELLETED FERTILIZERS



**FIELDSIDE DELIVERY** Even during periods of peak demand, Brea Brand dry fertilizers are available for less than 24-hour shipment and prompt delivery...direct to fieldside. Rapid fieldside delivery of these high-analysis drys cuts handling costs, saves time.

COLLIER CARBON AND CHEMICAL CORPORATION • 111 WEST OLYMPIC BOULEVARD, LOS ANGELES 15, CALIFORNIA  
MANUFACTURERS OF BREA BRAND FERTILIZERS • PRILLED AMMONIUM NITRATE • AMMONIUM SULPHATE • PELLETED FERTILIZERS

Western growers and dealers are enjoying the series of cartoon ads now appearing in regional farm publications...calling extra attention to some of the many benefits to be obtained from Brea Brand fertilizers.

Tie-in promotions available to dealers include envelope stuffers, wall or window posters, and note pads...all featuring the happy combination of

animal drawings that is guaranteed to bring a smile...and Brea Brand identification...to your grower customers.

Brea Brand fertilizers assure you less than 24-hour shipment...even during peak season...and rush shipments can be made direct to fieldside. You'll be notified when your shipment is coming, how it's coming, and the car number—ahead of shipment.

**KEEP YOURSELF AND YOUR CUSTOMERS IN GOOD HUMOR WITH BREA BRAND QUALITY AND SERVICE**

**ORDER BY WIRE...OR PHONE RICHMOND 7-6111 (Los Angeles)**



Carbon and Chemical Corporation  
MANUFACTURER OF

714 W. OLYMPIC BLVD., LOS ANGELES 15, CALIF.



**FERTILIZERS**

PRILLED AMMONIUM NITRATE / AMMONIUM SULPHATE / PELLETED FERTILIZERS

## Gloomicides

It seems this guy who owned a candy store in the Bronx saw a blue flame pass through his shop, heard a crack, and suddenly a genie appeared. The proprietor was frightened at first but relaxed when the genie smiled.

"Who are you?" he asked.

"I'm a genie."

"So what's a genie?"

"Why, I'm a magical person; I came to grant you a wish. Haven't you wished for something all your life?"

"Well, yes, I've always wanted to spend 2 weeks at Grossinger's with my wife and 2 kids, with all expenses paid."

"It's yours," said the genie.

"But who will run the candy store while I'm gone?" asked the proprietor.

"I will," the genie replied, and immediately the delighted owner began telling him . . . "The jelly beans are 3 for a cent—peppermint patties go for 2¢ apiece," etc.

Next morning, while the genie was tying on his apron, the first customer appeared.

"Make me a chocolate malted," said the customer.

"Okay," said the genie, looking up from behind the counter. "You are a chocolate malted."

★

A gushy relative of a pre-teen boy had not visited them for some time and greeted the boy with the standard, "Why, the last time I saw you, you were only so high!" "Yes," the lad agreed, "and you were only so wide."

★

Sign on TV set: "For sale. It's had only one owner—a little old lady with weak eyes."

★

Two fellows met at a bar. "Say," said the first, "what does your wife say when you're out this late?"

"Nothing," replied the other, "I'm not married."

The first fellow pondered for a moment, and asked, "Then why do you stay out this late?"

★

Economy is still a household word in America. It means a large-size package.

★

Three men and a dog were having cocktails in a bar. The dog was on a chair, handling his glass in a fashion even Emily Post would approve.

"That's some dog," commented the bartender. "He's almost human!"

"Brother, you can say that again," said the canine's owner. "Wait till you see him get out of paying for the next round!"

★

As mother and 10-year-old Larry trooped in, father looked up from a lapful of newspapers to ask what he'd learned at Sunday School.

"Well," said the lad, "our teacher told us about when God sent Moses behind the enemy lines to rescue the Israelites from the Egyptians. When they came to the Red Sea, Moses called for the engineers to build a pontoon bridge. After they all crossed, they looked back and saw the Egyptian tanks coming. Quick as a flash, Moses radioed headquarters on his walkie-talkie to send bombers to blow up the bridge and saved the Israelites."

"Larry," exclaimed his startled mother, "is that really the way your teacher told that story?"

"Well, not exactly," he replied, "but if I told it her way, you'd never believe it."

## Cachexia (or Xyloporosis) Harming California Fruit

BERKELEY, CAL.—A virus disease new to California is doing serious damage to tangerine and tangelo trees in desert areas, University of California scientists report.

Known as cachexia, or xyloporosis, the disease is believed also to be widely distributed in grapefruit and orange trees.

No insect carrier of the disease is known, according to Riverside plant pathologists E. C. Calavan and L. G. Weathers, who are studying the virus in cooperation with J. B. Carpenter of the U.S. Date Field Station, Indio.

Very severe in Israel and some other Mediterranean countries, cachexia is causing widespread damage in Florida, Texas, and Arizona, they report.

No quarantine measures appear necessary, the scientists declare, because the virus is probably already widely spread through the state's orchards, frequently in symptomless form.

Cachexia causes gum deposits, pitting of bark and wood, yellowing of foliage and tree stunting.

## SHOP TALK

(Continued from page 12)

brands. Doing so may cut down total sales volume for the line a little, but probably it will lower the needed inventory levels more than enough to offset any such drop in sales.

If a relatively small volume of sales is the reason for the low gross profit per dollar of inventory, the dealer needs to take a different course of action. The ways he can increase sales volume for the relatively unprofitable line include:

1. More aggressive and effective advertising.
2. More effective displays.
3. More aggressive counter and store selling.
4. Greater use of outside salesmen.
5. Customer meetings, demonstrations and other supplemental sales devices.
6. Increased services to customers, such as financing, management, and farm application.

## OSCAR & PAT

(Continued from page 13)

"If so many fellers spread in fall, I might as well do it. And I can still plowdown. The ground ain't frozen. Sharpen that pencil, Oscar, and give me your rock bottom price on 250 pounds per acre for six acres on corn. My soil rec is in your files. Pat took it last month."

Another farmer—Bill Macklin, a tall, skinny man, came in from the warehouse. "Holy cow," he said, "from the looks of all these pictures around here you'd think farmers are goin' to planting corn in fertilizer instead of soil. What happened?"

"Oh, I guess Pat just got some of his pictures developed and posted them," grinned Hampton. "Oscar don't like the expense, but it sure makes a feller think about fertilizin', don't it? Especially if he can get the right price." He winked at Macklin.

The latter agreed. "Now I know how my old lady feels when she walks into the department store durin' a sale. Pat's got my soil rec, but I been dilly dallyin' on it. See you're orderin' fertilizer spread. I reckon I might as well follow suit." He winked at Hampton. "Of course, I don't want to pay until after Christmas."

The door from the warehouse opened and Pat walked in. Oscar, with lips tight, laid down his pencil. "There's the finance manager," he said scornfully. "Ach, let him handle it. I'm the cash man. I don't believe in credit."

## What's Been Happening?

This column, a review of news reported in Croplife in recent weeks, is designed to keep retail dealers on the regional circulation plan up to date on industry happenings.

A total of 1.9 million short tons of marketable potassium salts were produced in the U.S. in the first half of 1958, the U.S. Bureau of Mines reported. This tonnage contained 1.1 million tons of K<sub>2</sub>O equivalent.

The Association of American Fertilizer Control Officials and the Association of American Pesticide Control Officials urged that defoliants, desiccants, plant regulators and nematocides should be brought within the scope of the Federal Insecticide, Fungicide and Rodenticide Act. The resolution was made at the two groups' annual meeting in Washington, Oct. 17 and 18.

The Association of American Fertilizer Control Officials, at its annual meeting, recommended that the taking of fertilizer samples be done at the individual fertilizer plants.

A conference on chemical control problems with emphasis on methods of analyzing fertilizers for determination of moisture, free acid, available P<sub>2</sub>O<sub>5</sub> and other content, was held in Washington, Oct. 16.

Hugo Riemer was named executive vice president of U.S. Borax and Chemical Corp., following a meeting of the board of directors in New York.

Prices paid to farmers advanced 2% in the month ended Sept. 15, USDA announced. This forward move was a surprise to many economists who had not expected to see a favorable rise at this time.

The number of cotton acres fertilized each year is second only to the corn crop, according to a USDA survey. Of 19 million acres of cotton harvested in 1954, year of the survey, 58% had received fertilizer.

**SunOlin Chemical Co.**, a joint subsidiary of Olin Mathieson Chemical Corp. and Sun Oil Co., was formed. The new firm will produce urea. James I. Harper of Sun Oil is president, and S. S. Johnson, Olin Mathieson, vice president.

Hercules Powder Co. announced that its new plant at Hercules, Cal., is producing urea in commercial quantities. The plant has a capacity of 20,000 tons a year.

California Spray-Chemical Corp., Richmond, Cal., announced that it plans to construct a \$4,600,000 chemical fertilizer plant at Kennewick, Wash. Completion is scheduled for the end of 1959.

Page Edmunds was appointed assistant general manager of chemicals in the W. R. Grace & Co. Davison chemical division. Mr. Edmunds was also made vice president of Davison Chemical Co., Ltd., Canadian affiliate of the division.

Fertilizer and pesticide sales prospects in cotton-growing areas of the U.S. appear to be brighter for next year since gross income of cotton growers improved this season. Gross income was estimated at \$1.95 billion as compared to \$1.5 billion last year.

Tobacco acreages of U.S. were reported by USDA as being heavy users of fertilizer materials. A state-by-state survey revealed that practically the entire acreage of tobacco receives large applications of fertilizer.

The New England Fertilizer Conference held at Melvin Village, N.H., attracted more than 100 persons, and was told by one of the speakers that farming efficiency and the introduction of many new materials and devices comprise a greater revolution than was the industrial revolution of the early 1800's.

Justin Potter was named president of Virginia-Carolina Chemical Corp. at a meeting of the board of directors. He succeeds William H. Wilson who resigned.

Edward R. Schumann was named to represent the National Plant Food Institute in the St. Paul District.

Permits to mix and distribute fertilizer-pesticide mixtures were given by the state of Virginia, providing rules of labeling and procedure are strictly observed. Aldrin and Heptachlor were the pesticides mentioned specifically in the announcement by the state's Department of Agriculture.

Sulfur production during July was 359,384 tons of native sulfur and 47,173 tons of recovered, the U.S. Bureau of Mines reported.

**J. H. Elliott, Rohm & Haas Co. of Canada, Ltd.**, was elected president of the Canadian Agricultural Chemicals Assn. at the group's meeting in Winnipeg in September.

A new coding system for improving the nomenclature of nitrogen solutions was suggested by the National Plant Food Institute. Its recommendation was based on the findings of an industry committee which made a study of the situation earlier.

Consolidated Laboratories, a newly-formed division of Schrock Fertilizer Service, Congerville, Ill., was dedicated Sept. 10.

Farm income for the first eight months of the year showed a greatly improved rate, as compared with the first eight months of 1957.

An estimated 31% of approximately 37 million acres of oats harvested during 1954 received fertilizer, according to a report prepared by U.S. Department of Agriculture researchers.

The recent grasshopper control program on ten Western States covered some five million acres, the U.S. Department of Agriculture reported. The effort was reported to have saved many thousands of acres of wheat and other small grain crops from insect damage.

A special working group representing industry and government is studying the needs of a comprehensive research program to find better means of controlling the boll weevil, most costly insect pest of the nation's cotton crop.

# Cost Control for Small Marketers

By GLENN A. WELSCH

Professor of Accounting, College of Business Administration, The University of Texas, Austin, Texas

Although great attention is usually given to increasing sales volume, control of costs is often neglected. Yet cost control is one of the soundest methods of increasing profits. Increased volume is of no consequence if costs rise to the extent that they offset earnings.

## Cost Consciousness

The first cost control pointer concerns your own attitude. Cost consciousness on your part will tend to impart a similar cost consciousness among your employees. Numerous surveys have shown that employees tend to view cost control in the same manner that their supervisors view it. Therefore, your attitude toward costs must be constructive and consistent.

Too many small marketers become vitally concerned with costs only when they see the annual profit figure. Such infrequent efforts usually result in (a) irresponsible decisions such as firing someone or slashing advertising expenditures, (b) antagonism of employees because of admonishments, (c) hesitancy to purchase adequately in quantity and quality, and (d) personal disturbance and worry on the top man's part. All of these results obviously will have a long-run adverse effect on a business.

## How Are You Doing?

A second cost control pointer concerns accounting and record-keeping. Do you know, each month, how you are doing profit-wise? Knowing what your profits are once a year is inadequate for planning and controlling your operations. You need to know the relationship of costs to income and profits every month so that you can take timely action to correct any undesirable conditions or trends. Otherwise it may be too late. Facts on how you are doing studied only once a year are not enough because they necessarily describe "ancient history."

One of the great temptations facing the small retailer is to "let the bank do the bookkeeping." There is, of course, considerable appeal in the thought that if all receipts are deposited and all payments made by check there will be adequate records and costs will take care of themselves. It is frequently thought that the bank balance indicates profit or loss—particularly when there are no credit sales or credit purchases.

The fact is, however, that cash and profits frequently have little relationship. For one thing, they differ on such items as taxes, insurance, and other costs met on an annual or longer basis. For another thing, changes in receivables, payables, and inventories, also create differences. And in many firms, depreciation is a major cost affecting profits, but not cash outlay.

Assume for example, that you own the building housing your business and that it costs \$100,000. Assume further that your building has an estimated life of 25 years. The "using up" of this building over the 25 years of its useful life involves an annual cost comparable to rent. Using "straight-line depreciation" your profits (but not your cash) will be reduced each year by \$4,000 ( $\$100,000 \div 25$ ) just as if you were paying this amount in rent each year. If your profits are not reduced each year for this depreciation expense, they will be overstated by that amount. If drawn out of the business they will constitute a withdrawal of

investment rather than profits.

## What to Do

Practical records can be both simple and relatively inexpensive. But many experts warn: "Don't try to set them up by yourself, and by all means don't entrust the designing to someone who is not a qualified accountant." Every firm, they point out, has peculiar characteristics which should be reflected in its accounting system. The safest course is to call in a competent public accountant to work out a simple yet adequate system of cost records and reports for your firm. In addition, if you wish, he will also instruct one or more of your employees in how to

record transactions, and advise you on how to utilize effectively the resulting financial data.

There are several organizations of accountants from which you may seek help in getting the right kind of professional assistance. Among the best known are the American Institute of Certified Public Accountants, 270 Madison Avenue, New York 16, N.Y.; and the National Society of Public Accountants, 1012 Fourteenth Street, N.W., Washington 5, D.C.

## Organize and Delegate

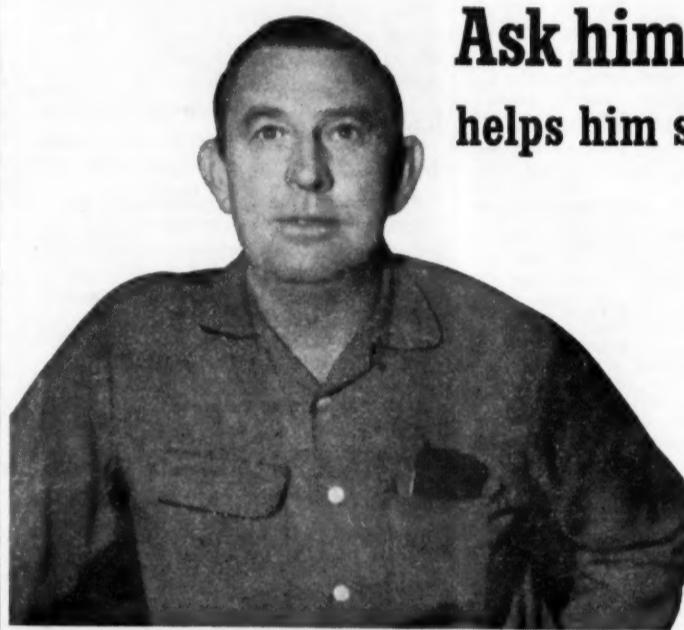
A third cost control pointer is to organize your operations and delegate cost control authority and responsibility. If your firm is large

enough to warrant employed supervisors in addition to yourself, carefully define their duties in relation to keeping costs down. Then give them authority to take corrective action if things start to get out of line. Hold them individually responsible for expenses related to the activities they supervise.

Having definite functional subdivisions makes improved control possible because (a) you can devote more of your time to looking into the nature of your cost problems, and (b) the ingenuity of your supervisors is utilized. Your accounting system should be set up so that your cost reports are broken down in terms of organizational responsibility.

## Chart Your Course

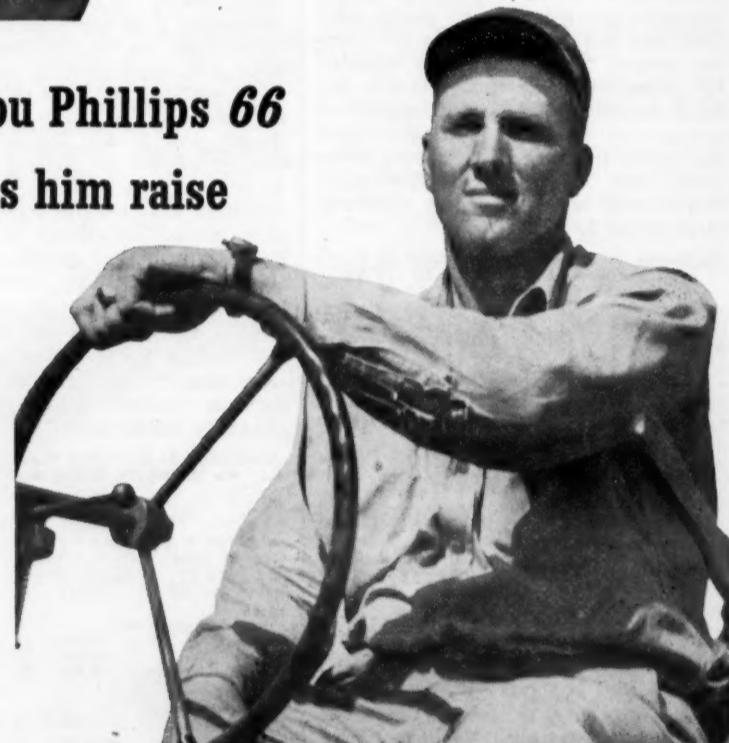
Irrespective of the size of your firm, planning provides the only



## Ask him: he'll tell you Phillips Service helps him sell more fertilizer

Clarence Osterbuhr, president of Anamo Co., Inc., Garden City, Kans., says: "I like to sell Phillips 66 Ammonium Nitrate because it's a first class product. But I also like Phillips service. Not only does my Phillips field man help me in many ways, but I can depend on the full resources of Phillips service, if I need them." Mr. Osterbuhr is just one of many dealers who find that the combination of a top quality product and Phillips service helps them make more sales and greater profits.

## Ask him: he'll tell you Phillips 66 Ammonium Nitrate helps him raise better crops



Frank Wise, who farms 960 acres near Dimmitt, Tex., says: "I like the way Phillips 66 Ammonium Nitrate stores and spreads. Nothing discourages a farmer more than to discover fertilizer skips when his crop starts coming on. Phillips 66 Ammonium Nitrate spreads evenly, and gives me a more uniform crop response." Word-of-mouth praise of Phillips 66 Ammonium Nitrate by satisfied users is making new customers for dealers everywhere. You, too, will find Phillips 66 Ammonium Nitrate and Phillips service a profitable combination.

## Ask us: Get all the facts about Phillips 66 Service. Call or write:

PHILLIPS PETROLEUM COMPANY

Phillips Chemical Company, A Subsidiary, Bartlesville, Oklahoma

### SALES OFFICES:

AMARILLO, TEX.—First Nat'l Bank Bldg.  
ATLANTA, GA.—1428 West Peachtree Street,  
Station "C" P. O. Box 7313  
BARTLESVILLE, OKLA.—Adams Bldg.  
CHICAGO, ILL.—7 South Dearborn St.  
DENVER, COLO.—1375 Kearney St.  
DES MOINES, IOWA—6th Floor, Hubbell Bldg.

HOUSTON, TEX.—6910 Fannin Street  
INDIANAPOLIS, IND.—3839 Meadows Drive  
KANSAS CITY, MO.—201 E. Armour Blvd.  
MINNEAPOLIS, MINN.—215 South 11th St.  
NEW YORK, N.Y.—80 Broadway  
OMAHA, NEB.—3212 Dodge St.  
PASADENA, CALIF.—317 North Lake Ave.

RALEIGH, N. C.—401 Oberlin Road  
SALT LAKE CITY, UTAH—68 South Main  
SPOKANE, WASH.—521 East Sprague  
ST. LOUIS, MO.—4251 Lindell Blvd.  
TAMPA, FLA.—3737 Neptune St.  
TULSA, OKLA.—1708 Utica Square  
WICHITA, KAN.—501 KFH Building



## SUMMARY

Successful firms, irrespective of size, consider costs to be one of their central problems. In fact, one primary reason for business success is often a constructive concern with costs and a continuous effort to keep them down. It has been demonstrated many times that costs will respond to systematic and logical efforts just as sales volume will.

In a small firm cost control must rest largely upon direct observation. Nevertheless, certain control techniques, supplementing observation, also have important applications. The complexity of operations, primarily, should determine the control techniques to be applied. The accompanying article was prepared with the cooperation of the Small Business Administration.

sound foundation for cost control. The most dangerous costs are those which build up in an unsupervised way. Long-distance telephone calls are made where letters would have done just as well. Discounts are missed through oversight. Careless handling leads to damaged items which are thrown out with little or no effort to reclaim them. These are the kinds of costs which planning can help to avoid.

Many small firms also have found it highly desirable to have a definite plan of operations or budget. Some concerns develop a 6-month plan of operations; others develop a 12-month plan. The central purposes in drawing up a written plan of operations are (a) to establish definite sales goals that are necessary to earn a satisfactory profit, (b) to establish definite cost goals related to making that profit, (c) to determine cash requirements, and (d) to implement basic, internal policies for the firm.

How can you chart your course? Sit down with pencil and paper and your supervisors (with perhaps some advice from your accountant) and look ahead for the next six months, following the steps outlined below:

**Step 1.** Work out a sales forecast or budget. This forecast is best developed by studying sales for the past year or two and applying the combined judgment of you and your salespeople in an honest effort to estimate the quantity of goods your firm can and should sell in the coming period. Sales should be detailed by principal lines; those having the same markup are best grouped together. To illustrate the procedure, assume your firm markets three principal lines, A, B, and C. Your sales budget may be developed as shown in illustration 1.

Illustration 1—Estimated Sales, Cost of Goods Sold, and Gross Profit Margin for the Six Months Ending June 30, 19—

	January		
	Last year	Plan	
Sales			
A	\$19,500	\$20,000	
B	20,700	21,600	
C	4,000	6,400	
Total	\$44,200	\$48,000	
Average mark-up			
A	29%	30%	
B	33	33	
C	42	40	
Cost of goods sold			
A	\$13,845	\$14,000	
B	13,800	14,400	
C	2,320	3,840	
Total	\$29,965	\$32,240	
Gross profit margin			
A	\$5,655	\$6,000	
B	6,900	7,200	
C	1,680	2,560	
Total	\$14,235	\$15,760	

January, only, is completed for illustrative purposes. The columns headed "Last Year" carry the actual data from last year merely to provide a basis for the estimates which you enter under the "Plan" columns. Note that you must forecast two items: sales dollars by principal lines, and average markup by the principal lines. In both cases, you have comparable figures for last year. Cost-of-goods-sold figures are derived by multiplying the sales estimates by the complement of the average markup estimates. For example, the cost of product line A in illustration 1 is  $\$20,000 \times (100\% - 30\%) = \$14,000$ . Gross-profit-margin figures are obtained either by subtracting the cost from sales, or by multiplying the sales estimates by the average markup estimates. Significantly, the cost-of-goods-sold figures, adjusted for in-

ventory changes and "backed up" for delivery time, become your open-to-buy estimates.

**Step 2.** Estimate your costs (based on the volume of sales predicted in illustration 1) along the lines shown in illustration 2.

Illustration 2—Estimated Costs for the Six Months Ending June 30, 19—

	January	Plan
Based on sales volume of ..	\$44,200	\$48,000
Variable costs		
Commissions (3%) .....	1,326	1,440
Repairs .....	90	100
Supplies used .....	30	30
Wages .....	2,400	2,500
Advertising-variable* .....	884	960
Estimated bad debt losses** .....	110	120
Miscellaneous .....	155	120
Total variable .....	\$ 4,995	\$ 5,270
Fixed costs		
Rent on building .....	\$ 250	\$ 250
Depreciation on equipment .....	100	100
Insurance .....	80	80
Taxes .....	50	50
Salaries .....	7,000	7,120
Advertising-fixed .....	300	370
Utilities .....	130	120
Total fixed .....	\$ 7,910	\$ 8,090
Total costs .....	\$12,905	\$13,360

Notes: \*2% of sales. \*\*1/4 of 1% sales.

List the fixed and variable costs separately for comparable periods last year. Fixed costs are those such as salaries that do not vary with the seasonal changes in sales volume but are determined by the passage of time and by your own decisions. The costs generally classified as variable are those which tend to vary with sales volume. If you have several departments it is essential for expenses to be budgeted by department, and to have the supervisor of each department assist directly in estimating his expenses. If you study the figures in illustration 2 for January, certain budget efforts to control costs may be seen. An increase in sales volume provides a basis for increasing certain costs, but—there is a definite limitation so that profits will reflect the increased sales volume anticipated.

**Step 3.** Construct your profit-and-loss budget by bringing together the sales budget (illustration 1) and the expense budget (illustration 2) as shown in illustration 3.

Illustration 3—Estimated Profit and Loss for the Six Months Ending June 30, 19—

	January		
	Last year	Plan	
Sales			
A	\$19,500	\$20,000	
B	20,700	21,600	
C	4,000	6,400	
Total	\$44,200	\$48,000	
Average mark-up			
A	29%	30%	
B	33	33	
C	42	40	
Cost of goods sold			
A	\$13,845	\$14,000	
B	13,800	14,400	
C	2,320	3,840	
Total	\$29,965	\$32,240	
Gross profit margin			
A	\$5,655	\$6,000	
B	6,900	7,200	
C	1,680	2,560	
Total	\$14,235	\$15,760	
Less:			
Variable expenses (Illus. No. 2) .....	4,995	5,270	
Marginal income .....	9,240	10,490	
Less:			
Fixed expenses (Illus. No. 2) .....	7,910	8,090	
Net profit (before income tax) .....	\$ 1,330	\$ 2,400	

Again comparable figures for last year are shown as a guide. Note in particular that (a) variable costs are subtracted from "gross margin" to derive "marginal income" and (b) a percentage analysis is included based on sales as 100%. Significantly, the 22% marginal income line in illustration 3 indicates that out of every \$1.00 of sales there is left \$.22 to cover fixed costs and make a profit. After fixed costs are covered, \$.22 out of each sales dollar is profit. Note that whereas last January earnings were 3% of sales, the budget anticipates earnings of 5%. This increase is due to the larger sales volume plus the definite cost control.

**Step 4.** Develop a cash budget

showing how much cash the budgeted sales will generate and how much cash will be required for purchases and expenses. (Although this step is not illustrated here, the technique is well explained in Management Aids for Small Manufacturers, No. 74, "Planning Your Working Capital Requirements.")

The sales figures adjusted for lag in collections (another control problem) provide the primary estimates of cash inflow. The cost-of-goods-sold figures adjusted for inventory changes and lag in payments together with the expenses (reduced for non-cash charges such as depreciation) provide the principal estimates of cash outflow.

## How Much Must You Sell Each Day?

Every small marketer should know within reasonable limits (a) the dollars of sales necessary each day on the average to break even, and (b) the dollars of sales necessary each day on the average to earn the budgeted profit for the month (5% in the illustration given). A budget developed along the lines illustrated above provides the data needed. To be specific, consider the following (based on illustration 3):

January		
Based on sales volume of ..	\$44,200	\$48,000
Variable costs		
Commissions (3%) .....	1,326	1,440
Repairs .....	90	100
Supplies used .....	30	30
Wages .....	2,400	2,500
Advertising-variable* .....	884	960
Estimated bad debt losses** .....	110	120
Miscellaneous .....	155	120
Total variable .....	\$ 4,995	\$ 5,270
Fixed costs		
Rent on building .....	\$ 250	\$ 250
Depreciation on equipment .....	100	100
Insurance .....	80	80
Taxes .....	50	50
Salaries .....	7,000	7,120
Advertising-fixed .....	300	370
Utilities .....	130	120
Total fixed .....	\$ 7,910	\$ 8,090
Total costs .....	\$12,905	\$13,360

Notes: \*2% of sales. \*\*1/4 of 1% sales.

Breakeven for January—

\$8,000 (fixed costs)	
.22 (marginal income %)	
=\$36,800 sales	

Breakeven per day—

\$36,800	
20 (days)	
=\$1,840 sales/day	

Sales per day to earn 5%—

\$48,000 (budget)	
20 (days)	
=\$2,400 sales/day	

## Control Means Action, Evaluation, and Followup

A budget has significance only when your plan is realistic. Thus, the final cost control pointer becomes clear; know your actual results on a monthly basis and compare them with the plan as developed on a monthly basis.

Illustration 4 is presented to indicate a type of reporting that is generally effective. Significantly, the planned or budgeted variable expense allowances are adjusted to the actual sales volume attained (\$49,000 in the illustration). For example, the allowance for commissions is adjusted to 3% of actual sales, advertising-variable to 2%, and estimated bad-debt losses to 1/4 of 1% of actual sales. The remaining variable expenses are adjusted for the volume differential in a similar manner. The "difference" columns immediately call your attention to unfavorable conditions.

### For Further Information

Businessmen interested in exploring further the subject of cost control may wish to consult the following references. Other good material, of course, could have been mentioned, but in keeping with the policy of the series this list is necessarily brief and selective. No slight is intended toward authors whose works are not included.

"Budgeting: Profit Planning and Control," by G. A. Welsch. Prentice-Hall, Inc., Englewood Cliffs, N.J. 1957. \$10.40.

"Management Accounting," by R. N. Anthony. Richard D. Irwin, Inc., 1818 Ridge Road, Homewood, Ill. 1956. \$6.75.

Illustration 4—Report of Expenses for the Month of January ... and Year to Date

	Month of January		Year to date	
	Actual	Planned	Better	Worse
Based on sales volume of ..	\$49,000	\$49,000		
Variable expenses:				
Commissions (3%) .....	\$ 1,470	\$ 1,470		
Repairs .....	114	102	\$12	
Supplies used .....	36	31	5	
Wages .....	2,510	2,550	\$40	
Advertising-variable (2%) .....	1			

## SAFETY MEETING

(Continued from page 1)

at Austin, Texas (Nov. 13-14) and San Francisco (Dec. 2-3).

W. C. Creel, director of safety for the North Carolina department of labor, Raleigh, told the assembly that there is a great and continuing need for safety emphasis in the fertilizer industry and that relatively little is being done about it on an industry scale. However, the safety schools are serving a need in this direction, he said. Of the schools thus far conducted, nearly 200 persons have attended, of which half were plant supervisors, and the remainder superintendents and safety directors.

Mr. Creel declared that the cooperation of the National Safety Council and the National Plant Food Institute was particularly valuable in making progress in safety within the industry. Aids from both of these groups are available to companies in the trade, he reminded.

Human life, he said, is of first consideration in any safety program, and it is toward the conservation of life and limb that the industry is working in its safety efforts. The speaker ended his talk with an appeal to all the firms in the industry to join the safety effort.

The importance of reporting and analyzing accidents in plants was emphasized in a talk by John E. Smith, safety director of Spencer Chemical Co., Pittsburgh, Kansas. Records on accidents are indispensable, he declared. "Without them, you don't know where you've been nor where you're going," he added.

The problem, Mr. Smith pointed out, is to keep top management sold on the value of a safety program, and accident reporting helps in this respect. Instead of merely spending money on such a program, it results in the saving of many dollars in improved all-round efficiency, better employee morale, and lower insurance rates.

Preparation of brief factual reports for management scrutiny helps to show how the company stands comparatively; whether progress has been made or not, it was pointed out.

As to information to be included on first aid and accident report forms, Mr. Smith said they should include the name, department, badge number, age of the person involved, as well as the name of his supervisor. This information is then sent to the insurance company and to the state, along with the supervisor's report and the names of witnesses. With this type of information at hand, steps may be taken to prevent recurrence of such an accident in the future.

Mr. Smith displayed accident report forms of the type used by multiple-plant firms and showed how simple it is to keep graphs and charts comparing the progress of various years.

He also presented statistics indicating the parts of the body most susceptible to accidents according to records of mishaps. The eyes were involved in 17.58% of accidents; the head in 12.39%; arms, 9.51%; trunk and hands 8.93%; fingers 22.76%; legs 9.22%; and feet 4.03%. Such statistics should be put into practical use, he emphasized. "They do no good lying in a desk drawer some place," he said.

Dr. John H. Foulger, director of medical research for E. I. duPont de Nemours & Co., Inc., Wilmington, Del., presented an analytical discussion on what makes an "accident prone" individual. He said that the question is one of long-standing: Why do some persons have more than their seeming share of mishaps? Is it a matter of pure chance? Does the first accident make him more susceptible to the second; the second to the third, and so on? Or, is the answer in neither chance nor chain reaction,

but rather a varying individual liability?

Dr. Foulger submitted that the third proposition was nearest to the fact, and expressed regret that the term "accident proneness" should be a stigma on a person, whereas such an assumption is not based on a firm foundation. The speaker quoted one authority as saying: "The accident proneness of various individuals is not fixed, but is liable to be affected by any and every change in their bodily condition. This condition is influenced by external changes in environment as well as by internal changes in his physical and mental health."

Using the blood pressure of individuals as a key to his studies, Dr. Foulger said that records on blood pressure, collected by hours of the day, indicated that the ratio of abnormal scores increased from the beginning of the work day up to about 11 a.m., then diminished slightly at the lunch hour. It increased again in the afternoon and moved upward until about an hour before the end of the work day. This same trend was noted in several plants in which studies were made, he said.

By comparing these studies with records on the trend of the number of accidents during the work day, a high degree of correlation was found between these two factors, he said.

"Of course, it has not been possible to correlate blood pressure status directly with the occurrence of accidents for an individual worker," he went on. "Obviously, since an accident is an unexpected event, one is not standing ready to measure the blood pressure before it occurs. Obviously also, since the action itself places a severe stress upon the worker, one can get no useful information by measuring blood pressure immediately after the accident has occurred."

The safety speaker told of numerous studies and observations wherein the physical condition of persons was a key factor in their susceptibility to accidents. Other factors, such as frustration, anger, preoccupation with family troubles or financial worries are not to be ignored, but do not form the complete picture, Dr. Foulger indicated.

In many plants, he said, little more progress may be made merely by attending to the safety of machines. The remaining thing is to study the worker from a physical as well as a psychological point of view. "There are many indications that deviations of bodily function are as controlling of mental attitude as mental attitude can be controlling of bodily function. Even though anger or frustration, or soreness at oneself or at others, may be a factor in many accidents, there may well be pertinent physiological conditions underlying these feelings.

"Hitherto, the active development and operation of safety programs has been in the hands of safety engineers," he said. "Plant physicians have been called only when needed to repair the results of failure of the program. Actually, the plant physician is not merely an industrial surgeon," he went on. "He is trained and has an interest in prevention of sickness and injury. He is concerned with the remedy of conditions which are the basis of liability to frequent, abnormal physiological patterns."

"Accidents occur when vulnerable individuals meet hazardous situations," the physician explained. "The elimination of the hazardous situation is the business of the safety engineer. The vulnerability of the individual is the concern of the industrial physician. It is most particularly

his concern when an individual, by sustaining multiple accidents, demonstrates frequent or continuous vulnerability."

Safe practices in handling anhydrous ammonia and nitrogen solutions were described in a paper by Vernon Page, Sohio Chemical Co., Lima, Ohio. Mr. Page reported the results of a questionnaire he had sent out to 75 midwestern plant superintendents in which questions had been asked about accidents and failures experienced in handling operations.

Eliminating minor mishaps, a total of 32 serious cases was reported, he said. Two of these had resulted in deaths and all the remainder had brought personal burns or a considerable loss of product. Of all these accidents, in only three was human error not a factor.

Some of the cases were reviewed by the speaker who said that over half of the reported mishaps resulted from faulty manipulation of valves and fittings.

In two accidents, anhydrous ammonia was confined in hoses between closed valves, without relieving devices. As the product warmed up, pressure increased, and the hoses ruptured. Three cases resulted from opening the wrong valve, presumably because the workman failed to check the "line-up" before cracking the valve.

In another case, the solutions pump was started while another man checked the sparger pipe. The speaker warned that unless the entire run of a line can be seen, one should never assume that all is clear.

Other accidents reported from this group of plants occurred as a result of "tapping" fittings by people who attempt to "repair" non-functioning fittings by striking them. In one case, a seeping safety valve was struck and it came fully open.

In another case, the operator did not believe the reading of the sight glass of his ammonia drum and tapped the gauge glass connections. The instrument broke and the worker escaped only because he was able to dash away on foot. Mr. Page emphasized that a little thought ahead of time would stop anyone from doing such foolish acts.

Two other serious cases resulted directly from trying to effect repairs while the lines were under pressure. In one case, a leaky union was tight-

ened with a pair of pipe wrenches, until the union failed.

"Let us pause for a moment now and reflect on these last few cases," the speaker said. "We are all prone to make stop-gap repairs in order to stay on stream. We will always do this. However, in the four preceding cases, the men did not take time out to get proper safety equipment and take proper safety precautions compatible with the possible results of their action. In short, they didn't realize the hazards."

Several accidents were due to disconnecting hoses without first venting off pressure, he said. Sending just one man to unload a tank car, particularly if he is not well experienced, is dangerous. Another risky situation is where a leaky valve system can not be completely shut off. "Going a step further," he said, "what about these cases where the discharge from the vent is not carried sufficiently far away or is pointed in a direction where a second party can be injured?"

In the general area of fitting failures, Mr. Page included those failures due to faulty materials of construction or poor construction. Two cases of failure of cast iron bushings were reported, and in another case, he said, a solution line broke off at the tank connection and there was no shut-off valve.

Six storage tank failures were reported. Four of these were presumably from overpressuring, one was an outright corrosion failure and the last was a result of a nitrate explosion. Storage tanks are either atmospheric tanks or pressure tanks. If a storage tank is to be subjected to pressure, it must be protected by a safety valve. The setting of the safety valve must be no higher than the weakest part of the tank as found through calculations.

There are three principal reasons why they fail:

1. The safety valve has been frozen shut because of corrosive action or nitrate deposits.
2. The metal has corroded considerably, reducing thickness.
3. No safety valve at all but the pressure reducing regulator is used on the air line.

There are also tank failures due to the explosion of ammonium nitrate. In every reported case, the pattern

(Turn to SAFETY MEETING, page 20)

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## NAC MEETING

(Continued from page 1)

The reduction in the number of farms and of farmers, the increase in the size of farms and the trends toward integration all are having an impact on the industry, Mr. Gillis said.

"In the next decade we are going to be selling to an increasingly well informed and sophisticated group of customers, the beneficiaries of government-supported research services which far surpass anything any of our companies can boast," Mr. Gillis said.

He urged the industry to stop thinking of the average farmer and "start thinking of the successful, prosperous farmer who is our best customer. In him we find a more responsible businessman, better qualified to judge the usefulness of our produce in terms of its economic returns to him."

Turning to the Miller bill (made law in 1955) requiring evidence of safe tolerance levels of pesticidal chemicals in food products, Mr. Gillis said that this should result in quicker adoption by farmers of products obtaining this clearance, but that such has not been the case to date. He proposed an educational campaign to farmers on the fact that nationally marketed pesticides now are government-tested and approved for use as directed on the label.

Mr. Gillis lauded the fact that renewed stability and profitability have been achieved by herbicide producers who have called a halt to consignment selling and adopted firmer pricing policies including the fair-trading of products. In contrast, he described the distribution channels for insecticides as "still as chaotic as they were in 1955."

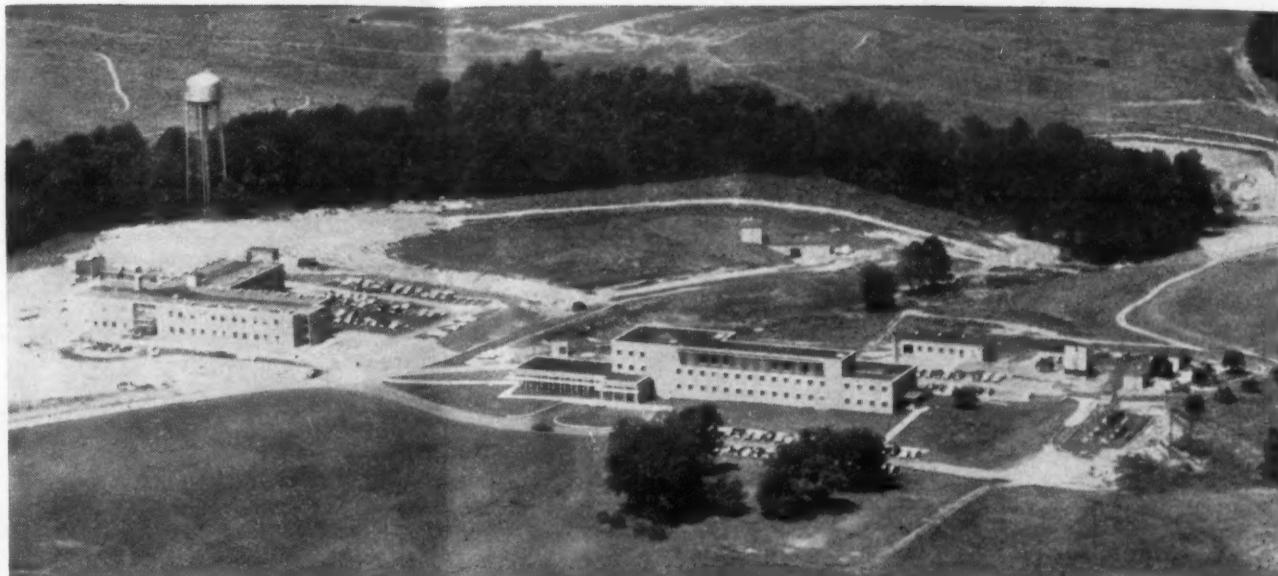
However, he was firm in predicting that the industry will rid itself, by normal attrition, of the "irresponsible entrepreneur" who does not contribute to the industry's technology nor to its economic service to the farmer.

Sen. Herman E. Talmadge (D., Ga.) predicted that "within two years Georgia will be free of the imported fire ants," now the subject of a major eradication campaign in nine southern states.

In an address at the opening session of the convention Sen. Talmadge reported that Georgia has already treated 110,000 acres for the fire ant in 25 counties at a cost of \$500,000. He said that an estimated additional 400,000 fire ant-infested acres in 21 more counties "indicates we still have a long way to go before every acre has been treated."

Sen. Talmadge saluted industry and state and federal entomologists for "the successful attack" on the fire ant, and said that the eradication program will relieve farmers of crop losses from this pest without the necessity of conducting annual control operations.

Sen. Talmadge linked pesticides and other agricultural chemicals to "recent improvements in grass land



**NEW RESEARCH CENTER**—An aerial view of W. R. Grace & Co.'s Washington Research Center. Situated on 150 acres in Clarksville, Md., the center is the 100th in-

dustrial research laboratory to be built in Maryland. It ranks fifth in size among these laboratories and is the state's largest industrial chemical research laboratory.

farming methods which have resulted in the development of a rapidly growing cattle and dairy industry in the southeast."

He paid tribute to the Georgia experiment station scientists at Tifton for their studies which paved the way for "this tremendous expansion" noting that total pasture and grazing land in Georgia, Alabama and Florida has increased by 774,000 acres in the last five years while nationally the decline of such acreage totalled 17 million acres from 1949 through 1954.

"Future growth of grassland farming in this area," he emphasized, "is going to be dependent, to a great extent, on the continued use of agricultural chemicals."

James J. Lawler, Shell Chemical Corp., New York, general convention committee chairman, opened the Oct. 29 morning session. Mr. Vernon presided over the session.

Later business sessions of the convention, which included discussion of product liability claims and new and expanding markets, will be covered in detail in the next issue of Croplife.

## SAFETY MEETING

(Continued from page 17)

was identical, Mr. Page said—an attempt to repair vessels and lines by welding detonated dry ammonium nitrate that had salted out from ammonium nitrate-bearing solutions. "Always use pipe cutters or hacksaws to cut into a nitrate line! As a further example of the properties of ammonium nitrate, I would like to quote from another letter: 'Burning off solutions lines is a matter of deep concern to us. We just recently experienced an explosion of ammonium nitrate in a solution line caused by a mechanic burning off a bracket holding the line in the mixer. The torch was not applied to the line itself, but the heat traveled from the bracket to the pipe, raising the temperature of the ammonium nitrate in the line to the point of explosion.'

In closing, Mr. Page suggested "three keys to safety" as follows:

1. Pause and study the job at hand.
2. Recognize the hazards associated with it.
3. Take action that will avoid or overcome these hazards.

He added, however, that no safety program will be entirely successful unless safe tools, sufficient safety equipment, properly inspected, and safety meetings and instruction are part of the picture. The leadership is up to management, he indicated. Workers are not likely to carry the responsibility for safety, he reminded.

The sessions of Tuesday, Oct. 21, comprised a talk on "Brainstorming for Safety" by Arthur C. Studt, manager, training and education, the Hotpoint Co., Chicago; showing of the sound movie, "Knowing's Not

## W. R. Grace & Co. Unveils \$5 Million Research Center Near Washington

CLARKSVILLE, MD.—W. R. Grace & Co. unveiled its new \$5 million Washington Research Laboratories here recently. Built in a rural area between Washington and Baltimore the center consists of two buildings on a 150-acre plot. The facilities are operated by Grace's research and development division for research in all phases of Grace activities, including the agricultural chemical operations of the Davison Chemical Division, Baltimore, and the Grace Chemical Division, Memphis.

A staff of 250 scientists and technicians is maintained at the center. The two buildings include 96,000 sq. ft. of floor space; two-thirds of the area is devoted to modern laboratories and complex experimental equipment.

A press tour of the facilities was conducted Oct. 21 at the invitation of J. Peter Grace, president of W. R. Grace & Co., and William P. Gage, president of the Grace Research and Development Division. Donald L. Fuller and Preston L. Veltman are directors of research at the Washington center.

In the agricultural research laboratories at the center the department is working on new combinations of fertilizer materials. Plant growth tests are moved out-of-doors to ex-

perimental field plots on farms surrounding the center for larger scale testing.

A miniature scale mixed fertilizer plant is located in the basement of one of the laboratories in order to simulate conditions found in commercial plants. The center also is studying other factors affecting plant growth, such as insects, weeds, fungi and nematodes.

In the new product development department one of the most unusual of a number of new products being investigated is silica aerogel as an insecticide. A fine white powder derived from processing sodium silicate and sulphuric acid, silical gel attacks the waxy coating protecting the body moisture of insects. The laboratories displayed a test program underway to evaluate the results of this discovery originating from work by Dr. Walter Ebeling at the University of California at Los Angeles.

The first building (at right in the photo) completed early this year is four stories in height and has 52,000 sq. ft. of floor space. In addition to 36 offices and 32 laboratories, it houses a library, conference room and a cafeteria.

The second building completed in September has 42,000 sq. ft. of floor space and includes 32 laboratories.

Enough," courtesy of U.S. Steel Corp., and a panel discussion on accident case histories.

Under the chairmanship of J. Lauren Shopen, safety director of Consumers' Cooperative Assn., Kansas City, Mo., the panel participants included Mike C. Ellison, protection supervisor, Mississippi Chemical Corp., Yazoo City, Miss.; C. S. Griffith, superintendent, Virginia-Carolina Chemical Corp., Cincinnati, Ohio; John S. Mark, production manager, Farm Bureau Cooperative Assn., Columbus, Ohio; Stratton M. McCargo, personnel supervisor, G.L.F. Soil Building Service, Ithaca, N.Y.; Gaither T. Newnam, manager, insurance department, Smith-Douglas Co., Inc., Norfolk, Va.; A. I. Raney, safety director, Phillips Chemical Co., Bartlesville, Okla.; W. D. Smith, assistant manager, insurance department, Southern States Cooperative, Inc., Richmond, Va., and W. A. Stone, superintendent, Wilson & Toomer Fertilizer Co., Jacksonville, Fla.

Case histories reported in the panel discussion involved numerous types of accidents, including those to employees from equipment and materials and, in at least one case, injury caused to a customer.

One accident involved the loss of fingers in a power saw situation; an-

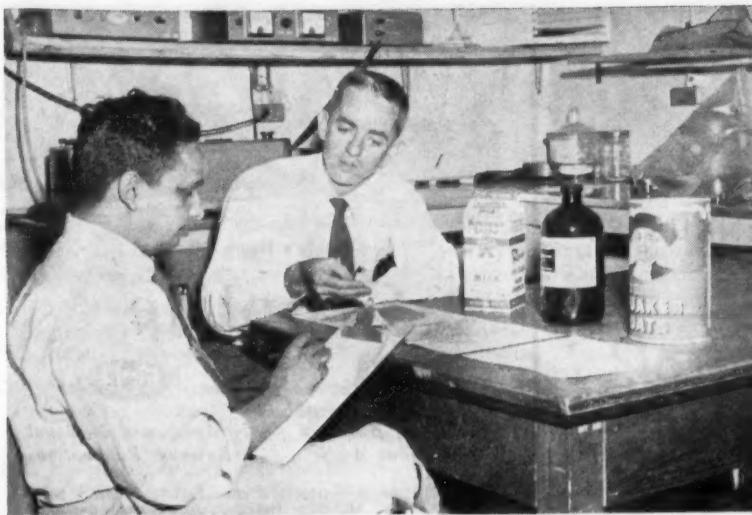
other serious burns inflicted on three men who had attempted to force an ammonia valve with a wrench; and still another involved a customer who hurt himself while attempting to move shuttle conveyors onto his truck.

Other speakers related experiences of similar nature wherein carelessness and lack of forethought brought ill results.

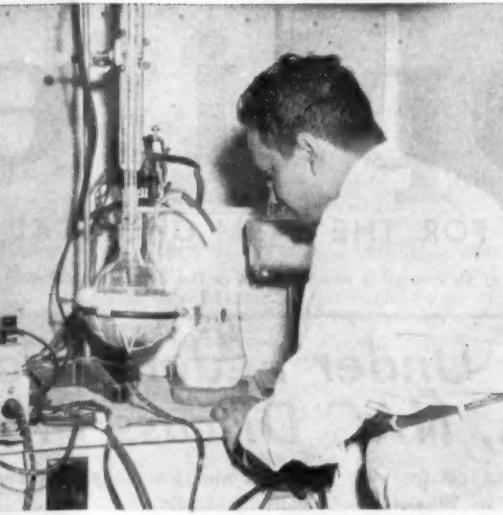
One speaker, telling about an anhydrous ammonia accident in his plant observed that four important considerations should be regarded in all phases of operation. They are:

1. Rules are for every one and must be enforced by strict discipline.
2. Haste often makes waste. The accident might not have happened if an experienced crew had been assigned the task of unloading the ammonia.
3. Accident investigation practices must be improved to reflect all conditions and acts leading to the accident.
4. The great need is for protecting not only against the known hazards, but the unknown ones as well. An ammonia valve may not be faulty, but the possibility that it might be is full justification for the exercise of extreme care in compliance with the rules at all times.





**CHLOROFORM EXPERIMENTS** — Lallan Rai (left), and Clifford Roan, Kansas State experimenters, are shown in the left photo discussing their latest findings from tests concerning chloroform as a grain fumigant chemical. One part of their work was to check residues left by the chemical on and in the grain and the grain



products. The photo at right shows Mr. Rai completing an experiment in which chloroform was evolved as a gas from wheat cooked in liquid suspension. The chloroform was trapped in acetone in an ice bath and later checked for color density on a Beckman DU spectrophotometer.

## "Relatively Good" Water Supply in West For 1959, Is USDA Survey Forecast

**WASHINGTON** — Generally abundant carryover storage in reservoirs on major streams of the West was reported today by the U.S. Department of Agriculture as holding promise of relatively good water supplies in 1959.

Irrigation and other water users experienced another good year in 1958, snow survey supervisors of USDA's Soil Conservation Service said. This was the result of heavy snow water runoff, high streamflow and good carryover storage. Even in the southwestern states of Arizona and New Mexico, a long trend of drought was reversed, with surface water supplies the best since 1952.

In some parts of the Columbia, Colorado and Great Basin watersheds, where soils are extremely dry, the need for heavy fall rains or above-normal winter snowpack to produce average runoff for the 1959 snowmelt season was noted. The report was released on the eve of the monthly winter snow survey measurements made cooperatively by the Soil Conservation Service, the Forest Service and other cooperating federal, state, local, and private agencies.

Where reservoir storage is not available, next year's water supplies depend upon the mountain snowpack and soil moisture, and upon rainfall during the growing season.

Continuing importance of conservation water management was emphasized by Donald A. Williams, administrator of the Soil Conservation Service, in releasing the fall water report. He pointed out that in a number of areas water went to waste, because of abundant supplies and bankfull streamflow at the start of the irrigating season, followed by late-season shortages resulting from summer drought and heavy draft on local water storage.

"Also," he said, "years of good water supply such as 1958 point up the importance of water storage facilities as needed, both for better distribution of water through the irrigation season and for balancing the available supply between dry years and those of abundant snow and rainfall."

"Demands upon our available water supplies are increasing every year, in the West and throughout the country. More and more water is required by agriculture, industry, rapidly expanding city populations, and for recreational and other uses. It is essential to make the most efficient use of our available water. Snow survey and related water-supply information is proving increasingly useful in helping

water users to adjust their operations to prospective supplies."

States included in the report are Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, New Mexico, Nevada, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington and Wyoming.

### Survey Indicates Spittlebug Can Be Threat Next Spring

**COLUMBUS, OHIO** — Spittlebugs will be present in damaging numbers in both red clover and alfalfa next spring, according to a survey conducted in Ohio recently.

R. P. Holdsworth, Jr., Ohio State University extension entomologist, and R. E. Treece, Ohio agricultural experiment station research entomologist, report the survey showed that spittlebug populations will be high enough to reduce the tonnage of the first growth unless fields are sprayed next spring with recommended insecticides.

Twenty-one representative counties were surveyed for populations of adult spittlebugs that lay eggs on grain stubble in fields seeded to clover and alfalfa. (A count of adults in September forecasts accurately whether there will be enough bugs in the fields to cause damage the next spring). All counties may expect injurious numbers of spittlebugs, the entomologists predict, with the exception of the four counties bordering Western Lake Erie, and even there it would be advisable to spray any field with a past history of spittlebug damage.

Spittlebug control is one of the best buys in farming, the entomologists explain, but many fields are not sprayed. Research in Ohio has shown that the first growth of red clover is very sensitive to spittlebug, and that a farmer reasonably may expect at least 25% more red clover hay if spittlebug is controlled.

Alfalfa is not as sensitive as red clover, according to the entomologist, but the record shows increases of 15% or more hay as a direct result of spittlebug control. On a 10-acre field where spittlebug is controlled, a farmer can expect to harvest 5 tons more of 20% moisture hay. He not only will get more hay but also better hay with more legume in proportion to grass. For the cost of insecticide plus application, that 5-ton increase is the best buy in feed.

### ENTER CHEMICAL FIELD

**DENVER, COLO.** — Colorado International Corp. announced that it will enter the agricultural chemical sales field and merchandising of chemical processing plants. The firm is headed by Phillip C. Mozer.

## Company Opens Two New Western Offices

**SAN FRANCISCO** — Wilson & Geo. Meyer & Co., Pacific Coast distributor of agricultural and industrial chemicals, announced from its San Francisco headquarters the opening of a new sales office in El Centro, Cal.

At the same time, Wilson & Geo. Meyer & Co. Intermountain, an affiliate company, announced opening of a new sales office in Twin Falls, Idaho, and enlargement of its sales staff at Salt Lake City.

The parent Meyer company's new sales office in El Centro, located in the heart of the Imperial Valley, will be headed by Leland Oberholser, who has been handling sales in the firm's Los Angeles office. A graduate of the University of California's college of agriculture, Mr. Oberholser joined the firm in 1956.

The new sales office of the Meyer Intermountain affiliate company in Twin Falls, serving farmers in the Midland Empire, will be headed by Marlowe Wood, who has been transferred from the firm's Salt Lake City office. Mr. Wood, a graduate of the Utah State Agricultural College, joined the firm in 1954.

James Burley has been added to the Salt Lake City sales staff of the Intermountain company. A graduate of the University of California in soils and plant nutrition, Mr. Burley has been active in agricultural sales work since his graduation in 1955.

The 108-year-old Meyer firm is sales representative in the West for many agricultural and industrial chemical producers, including Stauffer Chemical Co. and Western Phosphates, Inc., phosphatic fertilizers; Norsk Hydro, Norwegian calcium nitrate and urea; Canadian Peat Moss, Ltd., peat moss; Eastman Chemical Products, Inc., chemicals and plastics and Semet-Solvay division of Allied Chemical Corp., coke.

The firm has district offices in Los Angeles, Portland, Seattle and Salt Lake City.

### ENGINEERING MANAGER

**LOS ANGELES** — Appointment of Stanley Schneider as manager of engineering for the Helipot division of Beckman Instruments, Inc., by D. C. McNeely, acting division manager, is announced. Mr. Schneider will direct the design, development and modification of precision potentiometers and power monitoring equipment for the division. Beckman Helipot manufactures a variety of precision components for electronic instruments and communication and control systems. Mr. Schneider joined Beckman Helipot in 1953 as a research engineer, later served as a research group supervisor, and for the last two years has been chief research engineer.

## Formula Substitute In Grain Fumigants

**MANHATTAN, KANSAS** — A minor revolution in the stored grain fumigation business is coming up, entomologists at Kansas State College here believe.

This is the substitution of chloroform for other chemicals in carbon disulfide fumigation formulations.

Chloroform will be used in an 80-20 ratio with carbon disulfide in the same manner that carbon tetrachloride, for instance, is now used. It is probable that chloroform will permit the use of 25 to 30% carbon disulfide.

Extensive tests by Clifford Roan and Lallan Rai, K-State entomologists, plus field tests in cooperation with the stored products section of the USDA, have shown that chloroform formulations are effective and safe. The Food and Drug Administration recently approved chloroform for use as a grain fumigant.

The idea of using chloroform in fumigants is not new. It was evaluated in the 1920's and found to be good—but was forgotten because chloroform was not competitive in price at that time.

The new formulations are the outgrowth of cooperative research by the Kansas agricultural experiment station and Frontier Chemical Co. of Wichita. The investigations were begun as basic research, but work was switched to extensive investigations into the residue problem. Tests have shown no residues in or on the grain, and there are no residues in milled products of grain which has been fumigated.

## Program Plans Set For North Central Weed Control Meeting

**CINCINNATI** — Program plans for the North Central Weed Control Conference to be held here Dec. 3 and 4, have been announced by E. K. Alban and C. J. Willard of the committee on local arrangements.

Program highlights include:

- Welcome to Cincinnati, Mayor Donald D. Clancy.
- Greetings from the Ohio Agricultural Experiment Station, W. E. Krauss, associate director.
- President's welcome and remarks, Lyle A. Derscheid.
- "Botany, Plant Physiology and Plant Ecology," Bruce J. Rogers, Purdue University, chairman.
- "Weed Control in Horticultural Crops," S. K. Ries, Michigan State University, chairman.
- "Weed Control in Field Crops," Neal E. Shafer, University of Nebraska, chairman.
- "Weed Control (Annuals, Biennials and Perennials)," J. J. Sexsmith, Dominion Experimental Farms, chairman.
- "Weed and Brush Control in Industrial Areas," F. W. Slife, University of Illinois, chairman.
- "Regulatory and Extension," Howard T. Richards and D. R. Peterson, University of Wisconsin, chairmen.
- "Weed Control in Turf," R. R. Davis, Ohio Experiment Station, chairman.
- "Aquatic Weeds," B. H. Grigsby, Michigan State University, chairman.

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# Croplife

A WEEKLY NEWSPAPER FOR THE FARM CHEMICAL INDUSTRY

The regional circulation of this issue is concentrated in the Southern states.

## Plant Stimulants Under Federal Control? Control Officials, NAC Discuss Problem

**R**ESOLUTIONS adopted by the state control officials at their recent meetings in Washington should have the effect of straightening out some confusing points of law concerning the control of materials presently occupying a sort of no-man's-land. The gibberellins, plant regulators, desiccants, nematocides and defoliants should be included under the control provisions of the uniform state insecticide, fungicide, and rodenticide act and the counterpart regulations, rather than under the state fertilizer laws, the resolution stated.

A committee of the Association of American Pesticide Control Officials to investigate the plant growth stimulants has been at work on this problem for some time. Keeping in close touch with both the National Plant Food Institute and the National Agricultural Chemicals Assn. the committee members have succeeded in keeping their findings on a realistic level as regards the industry.

This was brought out by Lea S. Hitchner, executive secretary of the NAC Assn., in a talk before the control officials. The philosophy of his group concerning legislation was outlined as follows:

Legislation and regulation should protect the public adequately with a minimum burden on industry, he said. The effectiveness of legislation is only as good as its administration, and the education of all interested groups is necessary in order to minimize the need for legislation and regulation. If legislation is passed, the law must be made to work effectively.

Legislation, on the other hand, should not stifle research, greater production and better pest control, he declared.

Mr. Hitchner hit at some of the factors that influence legislation, pointing out the philosophy that more legislation or regulatory control is the answer to all problems, whether technical, social, or economic. "Unfortunately, there is a small, irresponsible group in every field of human activity which forces restrictive legislation," he observed. Organized groups, looking at only one side of a problem but vigorously pushing for impractical restrictions, can put an unnecessary strain on the industry, he continued. There are also factors of selfish groups pressing for legislation to place a burden on one group in order to minimize their own responsibilities.

Mr. Hitchner also mentioned the desire of some legislators for publicity and popular support and the pressure of some governmental agencies for larger staffs and more power.

He then asked the question, "Are we moving too fast on legislation and regulations without due consideration of the consequences?" He reminded that it takes time to make a new law work, and much education is necessary not only between industry and the enforcement officials, but also among those using the pesticidal materials.

Another pertinent question brought up in the discourse was that of developing new pesticidal chemicals, cost of which runs from \$500,000 to \$1,500,000. Will a superabundance of legislation slow development to the point where we do not have materials to meet growing pest problems? How much might legislation concentrate industry in the hands of a few manufacturers? From what source will sufficient technical personnel be available, both in industry and government, to comply with all of the technical requirements of the various laws? These questions, brought up by the NAC secretary, are practical ones and need to be

thought about seriously by responsible people in the trade.

In view of the foregoing, the move toward legislation that would bring defoliants, desiccants and plant regulators within the scope of the Federal Insecticide, Fungicide and Rodenticide Act, seems entirely logical. It is encouraging to see teamwork being displayed between the various interested groups. It points in the right direction.

Of course the final decision is up to the Congress. It is seldom wise to predict with any degree of sureness that these lawmakers will or will not act on any given proposal. However, many in Congress will recognize the necessity of a decision on this matter. An industry as complex and important as the pesticide and fertilizer trades should not have to be uncertain about the status of materials with which they work.

### Safety Effort Reduces Accidents in 172 Plants

**F**ERTILIZER industry men attending the annual meeting of the Fertilizer Section of the National Safety Council in Chicago recently, were happy to hear that some 172 firms participating in the safety contest on a nationwide basis, had reduced their accident rates drastically over a period of four years. Not only should those present be cheered by this achievement, but the rest of the industry should likewise take note.

George F. Dietz, chairman of the group, said that in 1955 when the contest began, the 173 firms then in the contest had an accident frequency rate of 17.27. By the next year, the score was improved to a point of 10.59, and in 1957, it remained about the same.

But in 1958 (through the month of July) the accident frequency rate had dropped to an unprecedented low of 7.94!

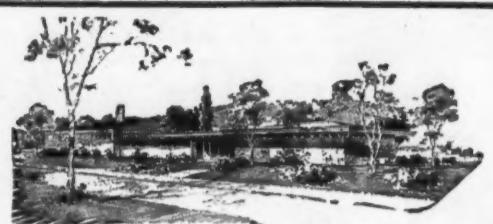
It is of utmost significance that only those companies taking part in the industry safety movement were beneficiaries of this improved record. These are firms where extra emphasis is laid on safety and safe practices, and to their benefit accrues not only a bit of pride at achieving a good record, but with it comes additional dividends such as better employee morale, more efficient production and, in some cases, lowered insurance premium rates.

With such benefits so easily within reach of all fertilizer manufacturers, large and small, it seems odd that not all firms are represented in the safety movement.

The added complexity of fertilizer manufacturing and the handling of many of its products call for an infinitely greater degree of careful and knowledgeable operation than ever before. Knowledge of safe handling of anhydrous ammonia both to and from tank cars and storage tanks is of obvious importance, and a lack of information on its properties can lead to disaster. Discussions with specialists who know the whole score, plus literature and other educational helps will be very valuable.

### Keeping Feet on the Ground Important Occupation

**W**HILE Soviet scientists busy themselves in building Sputniks and other out-of-this-world missiles and satellites, progress seems slow indeed when it comes to the application of technical knowledge to down-to-earth matters in that country. Official reports have it that the Russian farmer produces enough each year for himself and three others, while his American counterpart slaves away under our "decadent" system and produces enough for himself and 23 other people.



Croplife's Home Office

## Croplife



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CROPLIFE is a controlled circulation journal published weekly. Weekly distribution of each issue is made to the fertilizer manufacturers, pesticide formulators and basic chemical manufacturers. In addition, the dealer-distributor-farm adviser segment of the agricultural chemical industry is covered on a regional (crop-area) basis with a mailing schedule which covers consecutively, one each week, four geographic regions (Northeast, South, Midwest and West) of the U.S. with one of four regional dealer issues. To those not eligible for this controlled distribution Croplife subscription rate is \$5 for one year (\$8 a year outside the U.S.). Single copy price, 25¢.

LAWRENCE A. LONG

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DONALD NETH

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# MEETING MEMOS

Nov. 12-13—Oregon Weed Conference, seventh annual meeting, Sacajawea Hotel, LaGrande, Ore.

Nov. 13-14—Farm Advisers Fertilizer Technology School, University of California, Riverside.

Nov. 13-14—Southwestern Accident Prevention School, Sheraton-Terrace Motor Hotel, Austin, Texas.

Nov. 18—Arizona Agricultural Chemicals Assn., annual meeting, Westward Ho Hotel, Phoenix, Ariz.

Nov. 20-21—Two Day Joint Meeting, National Agricultural Chemicals Assn. and Commercial Chemical Development Assn., Lord Baltimore Hotel, Baltimore, Md.

Dec. 2-3—Far West Regional Accident Prevention School, Fresno, Cal.

Jan. 20-22—California Weed Conference, Miramar Hotel, Santa Barbara, Cal.

Meeting Memos listed above are being listed in this department this week for the first time.

Nov. 5-7—Fertilizer Industry Round Table, Mayflower Hotel, Washington, D.C.

Nov. 9-11—California Fertilizer Assn., 35th Annual Convention, Ambassador Hotel, Los Angeles, Sidney H. Bierly, 475 Huntington Drive, San Marino 9, Cal., General Manager.

Nov. 10-11—Agricultural Aviation Research Conference, Milwaukee.

Nov. 11-13—New York State Insecticide and Fungicide Conference, 20th Annual Meeting; and 11th Annual Pesticide Application Equipment Conference, Bibbins Hall, Cornell University, Ithaca, N.Y.

Nov. 12-13—Chemical Market Research Assn., Fall Meeting, St. Paul Hotel, St. Paul, Minn.

Nov. 12-13—Oregon Weed Conference, annual meeting; La Grande, Ore.

Nov. 13-14—Southwest Accident Prevention School for Fertilizer Plant Supervisory personnel, Sheraton-Terrace Motor Hotel, Austin, Texas.

Nov. 16-18—National Fertilizer Solutions Assn., Netherland Hilton Hotel, Cincinnati, M. F. Collie, 2217 Tribune Tower, Chicago, Executive Secretary.

Nov. 18-20—Washington State Weed Conference, Moses Lake, Wash.

Nov. 19-20—Carolinas-Virginia Pesticide Formulators' Assn., Carolina Hotel, Pinehurst, N.C.

Nov. 24-25—Entomological Society of America, Eastern Branch, Annual Meeting, Lord Baltimore Hotel, Baltimore.

Nov. 25—Eighth Semi-Annual Meeting and Winter Conference, Manufacturing Chemists' Assn., Hotel Statler, New York.

Dec. 1-4—Entomological Society of America, Annual Meeting, Hotel Utah, Salt Lake City.

Dec. 3-4—North Central Weed Control Conference, Netherland Hilton Hotel, Cincinnati.

Dec. 3-4—Annual Soil Fertility and Plant Nutrition Short Course, University of Missouri, College of Agriculture, Columbia, Mo.

Dec. 3-5—Agricultural Ammonia Institute, Annual Meeting, Morrison Hotel, Chicago, Jack F. Criswell, Claridge Hotel, Memphis, Executive Vice President.

Dec. 8—Annual Soils and Fertilizer Short Course, Coffey Hall, University of Minnesota Institute of Agriculture, St. Paul.

Dec. 8-10—Chemical Specialties Manufacturers Assn., Annual Meeting, Commodore Hotel, New York.

Dec. 17-18—Beltwide Cotton Production Conference, Rice Hotel, Houston, Texas, sponsored by the National Cotton Council.

1959

Jan. 7-8—Fertilizer Short Course, Iowa State College, Ames.

Jan. 7-8—Fifth Annual Insect Control Conference, Mississippi State University, State College, Miss.

Jan. 7-9—Thirteenth Annual Northeastern Weed Control Conference, Hotel New Yorker, New York.

Jan. 20-22—California Weed Conference, Santa Barbara, Cal.

Jan. 12-13—Ohio Pesticide Institute, annual winter meeting, Neil House, Columbus, Ohio. J. D. Wilson, Secretary, Agricultural Experiment Station, Wooster, Ohio.

Jan. 21-22—Northwest Agricultural Chemicals Industry Conference, Benson Hotel, Portland, Ore.; George Kitzmiller, Pacific Cooperatives, Portland, conference chairman.

Jan. 21-23—Western Cooperative Spray Project, Benson and Imperial Hotels, Portland, Ore.

Jan. 22-24—Agricultural Aircraft Assn., Senator Hotel, Sacramento, Cal.; Wanda Branstetter, Chandler Field, Fresno, Cal., Executive Secretary.

Jan. 28-29—Illinois Custom Spray Operators' Training School, 11th annual meeting, University of Illinois, Urbana.

Jan. 29-30—Colorado Agricultural Chemicals Assn., Cosmopolitan Hotel, Denver. D. E. Garrison, Box 623, Greeley, Colo., secretary.

July 7-9—Pacific Northwest Plant Food Assn., 10th Annual Regional Fertilizer Conference, Tacoma, Wash.

## CALENDAR FOR 1958-59

NOVEMBER					DECEMBER					JANUARY					FEBRUARY				
S	M	T	W	F	S	M	T	W	F	S	M	T	W	F	S	M	T	W	F
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30																			
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29	30	31																	
JULY					AUGUST					SEPTEMBER					OCTOBER				
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19	20	21	22	23	24	25	26	27	28	29	30	31							
26	27	28	29	30	31														

## Triples Loading Speed With Larger Hoses

STOCKTON, CAL.—Load-out speed at the Agriform of Northern California plant here has been more than trebled since the installation of larger line sizes on each of the eight load out pumps, the company reports.

Demont Galbraith, president, has installed 4 in. diameter hose instead of 2 or 2 1/2 in. As a result, each of the eight pumps can load a 20-ton capacity truck with liquid fertilizer in bulk in about 12 min. instead of 40 min., Mr. Galbraith said. In rush periods this increase in speed reduces backlog and permits shipment of some 500 to 600 tons per day from the plant.

Mr. Galbraith also announced that the company has been licensed by the Tennessee Valley Authority to produce such higher concentrations of liquid mixes as superphosphoric acid developed by the TVA. Production on the fertilizer, however, has not begun.

## Classified Ads

Classified advertisements accepted until Tuesday each week for the issue of the following Monday.

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**Men of the Soil**, by Dr. S. H. Benedict, Shell Chemical Corp., New York; **The Changing Insecticide Picture**, by S. A. Hall, director of the pesticide chemicals research laboratories, USDA, and **Your Business and Mine**, by Parke C. Brinkley, commissioner, Department of Agriculture and Immigration for Virginia.

The Honorable L. H. Fountain, U.S. Representative from North Carolina and L. M. Sparks, Jr., extension entomologist, Clemson College, Clemson, S.C., will also address the group.

## INDEX OF ADVERTISERS

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Allied Chemical Corp., Nitrogen Div.	2
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Beginning

January 19, 1959

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